

Exhibit 2

Moon Duchin , PhD
The South Carolina State Confvs.McMaster/Alexander

July 14, 2022

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IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF SOUTH CAROLINA
COLUMBIA DIVISION

THE SOUTH CAROLINA STATE
CONFERENCE OF THE NAACP

and

TAIWAN SCOTT, ON BEHALF OF HIMSELF
AND ALL OTHER SIMILARLY SITUATED
PERSONS,

Plaintiffs,

vs. Case No. 3:21-CV-03302-JMC-TJH-RMG

THOMAS C. ALEXANDER, IN HIS OFFICIAL CAPACITY AS PRESIDENT OF THE SENATE; LUKE A. RANKIN, IN HIS OFFICIAL CAPACITY AS CHAIRMAN OF THE SENATE JUDICIARY COMMITTEE; MURRELL SMITH, IN HIS OFFICIAL CAPACITY AS SPEAKER OF THE HOUSE OF REPRESENTATIVES; CHRIS MURPHY, IN HIS OFFICIAL CAPACITY AS CHAIRMAN OF THE HOUSE OF REPRESENTATIVES JUDICIARY COMMITTEE; WALLACE H. JORDAN, IN HIS OFFICIAL CAPACITY AS CHAIRMAN OF THE HOUSE OF REPRESENTATIVES ELECTIONS LAW SUBCOMMITTEE; HOWARD KNAPP, IN HIS OFFICIAL CAPACITY AS INTERIM EXECUTIVE DIRECTOR OF THE SOUTH CAROLINA STATE ELECTION COMMISSION; JOHN WELLS, JOANNE DAY, CLIFFORD J. EDLER, LINDA MCCALL, AND SCOTT MOSELEY, IN THEIR OFFICIAL CAPACITIES AS MEMBERS OF THE SOUTH CAROLINA STATE ELECTION COMMISSION.

Defendants.

DEPOSITION OF: MOON DUCHIN, PHD
(Via Videoconference)

DATE: Tuesday, July 14, 2022

TIME: 10:13 a.m.

Moon Duchin , PhD
The South Carolina State Confvs.McMaster/Alexander

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1 LOCATION: Barnum Hall 2 Packard Avenue 2 Medford, Massachusetts 3 TAKEN BY: Counsel for Thomas Alexander and Luke Rankin 4 5 REPORTED BY: Elaine L. Grove-DeFreitas, Independent Professional Reporter (Via Videoconference) 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25	Page 2	Page 4
		1 APPEARANCES OF COUNSEL: 2 3 ATTORNEYS FOR THE HOUSE DEFENDANTS: 4 NEXSEN PRUET, LLC 5 BY: ANDREW MATHIAS 104 South Main Street 5 Suite 900 6 Greenville, South Carolina 29601 6 864-370-2211 7 AMathias@nexsenpruet.com 7 (Via Videoconference) 8 9 ATTORNEYS FOR ELECTION DEFENDANTS: 10 BURR & FORMAN, LLP 11 BY: JANE W. TRINKLEY 12 1221 Main Street 12 Suite 1800 13 Columbia, South Carolina 29201 13 803-799-9800 13 jtrinkley@burr.com 13 (Via Videoconference) 14 15 16 ALSO PRESENT: Cyndi Nygord (via videoconference) 17 18 19 20 21 22 23 24 25
	Page 3	Page 5
1 APPEARANCES OF COUNSEL: 2 ATTORNEYS FOR THE PLAINTIFFS 3 THE SOUTH CAROLINA STATE CONFERENCE OF THE NAACP AND MOON DUCHIN, PhD: 4 NAACP LEGAL DEFENSE & EDUCATIONAL FUND, INC. 5 BY: LEAH ADEN 6 BY: JOHN CUSICK 40 Rector Street 7 Fifth Floor New York, New York 10006 8 917-858-2870 laden@naacpldf.org 9 jcusick@naacpldf.org (Via Videoconference) 10 11 ATTORNEYS FOR THOMAS C. ALEXANDER AND LUKE A. RANKIN: 13 JONES DAY 13 BY: JOHN M. GORE 14 51 Louisiana Avenue, N.W. Washington, D.C. 20001 15 202-879-3930 jmgore@jonesday.com 16 (Via Videoconference) 17 18 ATTORNEYS FOR THE AMERICAN CIVIL LIBERTIES UNION: 19 AMERICAN CIVIL LIBERTIES UNION 20 BY: ADRIEL I. CEPEDA DERIEUX 125 Broad Street 21 18th Floor New York, New York 10004 22 212-549-2500 ACepedaDerieux@aclu.org 23 (Via Videoconference) 24 25	1 I N D E X 2 EXAMINATION 3 BY MR. GORE..... 6/3 4 BY MS. TRINKLEY..... 222/5 5 BY MR. MATHIAS..... 222/23 6 BY MS. ADEN..... 257/13 7 BY MR. GORE..... 269/1 8 CERTIFICATE OF REPORTER..... 270 9 10 E X H I B I T S 11 EXHIBIT 1, Senate Defendants' Notice Of Taking Videoconference Deposition Of Dr. Moon Duchin.. 10/25 12 13 EXHIBIT 2, April 11, 2022 Report on South Carolina Congressional Districts..... 26/14 15 EXHIBIT 3, 2021 Guidelines and Criteria for Congressional and Legislative Redistricting.... 41/23 16 EXHIBIT 4, 2021 Redistricting Guidelines..... 49/19 17 EXHIBIT 5, No Exhibit Introduced..... -- 18 EXHIBIT 6, Curriculum Vitae of Moon Duchin, PhD 195/24 19 EXHIBIT 7, Expert Report of Sean P. Trede..... 196/16 20 EXHIBIT 8, May 4, 2022 Response to the Expert Report of Sean P. Trede dated April 18, 2022.. 197/17 21 22 23 24 25	

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<p>1 MOON DUCHIN, PHD,</p> <p>2 being first duly sworn, testified as follows:</p> <p>3 DIRECT EXAMINATION</p> <p>4 BY MR. GORE:</p> <p>5 Q. Good morning, Dr. Duchin. My name is</p> <p>6 John Gore. I'm with the Law Firm of Jones Day. I</p> <p>7 represent the Senate Defendants, Thomas Alexander</p> <p>8 and Luke Rankin in connection with the redistricting</p> <p>9 challenge that has been brought in the United States</p> <p>10 District Court for the District of South Carolina.</p> <p>11 And you understand that you're appearing in</p> <p>12 connection with that case today. Correct?</p> <p>13 A. Yes.</p> <p>14 Q. And will you say and spell your first</p> <p>15 and last names for the record, please?</p> <p>16 A. Sure. It's Moon Duchin. That's</p> <p>17 M-O-O-N, D-U-C-H-I-N.</p> <p>18 Q. And you understand that you're under</p> <p>19 oath and have an obligation to tell the truth today.</p> <p>20 Correct?</p> <p>21 A. I do.</p> <p>22 Q. We have a court reporter here to take</p> <p>23 down your testimony. The court reporter does need</p> <p>24 verbal answers, so please give a verbal answer to</p> <p>25 each question, a yes or a no. The court reporter</p>	Page 7	<p>1 answer the question before we go to the break. Is</p> <p>2 that fair?</p> <p>3 A. Yes.</p> <p>4 Q. Okay. Thank you. So Dr. Duchin, where</p> <p>5 are you today?</p> <p>6 A. I'm at Tufts University in</p> <p>7 Massachusetts.</p> <p>8 Q. And is anyone in the room with you?</p> <p>9 A. No.</p> <p>10 Q. And do you have any papers with you</p> <p>11 where you are?</p> <p>12 A. I do not.</p> <p>13 Q. What did you do to prepare for today's</p> <p>14 deposition?</p> <p>15 A. I did two preparation sessions with</p> <p>16 counsel in which we reviewed the materials and</p> <p>17 discussed some likely questions.</p> <p>18 Q. And when did the first of those two</p> <p>19 sessions take place?</p> <p>20 A. Late last week. I believe it was</p> <p>21 Friday.</p> <p>22 Q. And how long did it last?</p> <p>23 A. One to two hours.</p> <p>24 Q. Who was present?</p> <p>25 A. Leah Aden and John Cusick, both of whom</p>	Page 9
<p>1 cannot record a nod or a headshake. Does that sound</p> <p>2 fair?</p> <p>3 A. Yes.</p> <p>4 Q. And you're being defended in this</p> <p>5 deposition today by Ms. Aden, I believe. Is that</p> <p>6 right?</p> <p>7 A. Yes.</p> <p>8 Q. And Ms. Aden may object to a question</p> <p>9 that I pose, such as an objection to form or</p> <p>10 something like that. Unless you're instructed not</p> <p>11 to answer, you can go ahead and answer my question.</p> <p>12 Does that make sense?</p> <p>13 A. Yes.</p> <p>14 Q. And the most important rule here today</p> <p>15 is if you don't understand a question, will you ask</p> <p>16 me to clarify the question?</p> <p>17 A. Yes.</p> <p>18 Q. And if you do answer a question, I will</p> <p>19 assume that you understood it. Is that fair?</p> <p>20 A. Yes.</p> <p>21 Q. Also, this is not a marathon. It may</p> <p>22 feel a little bit like a slog at times, but if you</p> <p>23 need to take a break for any reason, at any time</p> <p>24 just let me know and we can do that. The only thing</p> <p>25 that I ask is that if a question is pending, you</p>		<p>1 are on the call today, and myself.</p> <p>2 Q. And when did the second preparation</p> <p>3 session take place?</p> <p>4 A. Tuesday, the day before yesterday.</p> <p>5 Q. And how long did that last?</p> <p>6 A. I would estimate that was about an hour.</p> <p>7 Q. Who was present?</p> <p>8 A. The same people.</p> <p>9 Q. And did you review any documents in</p> <p>10 preparation for today's deposition?</p> <p>11 A. Yes.</p> <p>12 Q. And which documents did you review?</p> <p>13 A. We reviewed my two reports that I</p> <p>14 believe are dated April 11th and May 4th. We may</p> <p>15 have briefly reviewed the House and the Senate</p> <p>16 Guidelines on redistricting. That is all that I</p> <p>17 recall.</p> <p>18 Q. Do you know why you were retained to</p> <p>19 provide a report in this case?</p> <p>20 A. Yes. I discussed the assignment with in</p> <p>21 my first report, but -- so can we pull that up?</p> <p>22 Q. We can. Just one second. Let me ask</p> <p>23 you a question, first, if that's okay.</p> <p>24 A. Sure.</p> <p>25 Q. Do you recall who first contacted you</p>	

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<p style="text-align: right;">Page 10</p> <p>1 about doing a report in this case? 2 A. As I recall, it was Leah Aden. 3 Q. And when did that take place? 4 A. That, I'm not sure. It feels like a 5 very long time ago because this has been along 6 redistricting season. But as you know, I also 7 provided reports in the State House redistricting 8 matter and so I may have been retained as much as 9 six months ago or more. I can look up the date, but 10 I'm not sure, as I speak.</p> <p>11 Q. And other than these two matters in 12 South Carolina have you previously been retained by 13 Ms. Aden or the NAACP Legal Defense Fund?</p> <p>14 A. Yes. Not working with Ms. Aden, but I 15 did work with LDF in Alabama. I am still working 16 for LDF in Alabama.</p> <p>17 Q. How about the ACLU?</p> <p>18 A. I have not been retained by the ACLU.</p> <p>19 Q. What about the Law Firm of Arnold & 20 Porter?</p> <p>21 A. No. That is no, I have not been 22 retained by Arnold & Porter.</p> <p>23 Q. Got you. So we can go ahead and 24 introduce this exhibit as Exhibit 1.</p> <p>25 (Exhibit No. 1, Senate Defendants' Notice Of Taking</p>	<p style="text-align: right;">Page 12</p> <p>1 representatives in connection with this case. 2 Prior to today's deposition did you do 3 anything to collect documents that would fall into 4 that category?</p> <p>5 A. Yes. I made an attempt to review all of 6 my communications with counsel to see what materials 7 had been provided.</p> <p>8 Q. And letter J asks for copies of any 9 communications exchanged by and between you and 10 plaintiff's counsel in connection with this matter.</p> <p>11 Did you do anything to review and collect those 12 documents?</p> <p>13 A. I did review those documents. And I 14 believe they were provided by counsel. Certainly, 15 not directly by me.</p> <p>16 Q. And did plaintiff's counsel in this case 17 provide you any facts to use in your -- in preparing 18 your reports?</p> <p>19 A. That is -- let me just try and clarify 20 the question. When you say provide me facts, do you 21 mean represent to me that things were true?</p> <p>22 Q. Represent to you that things were true 23 or provide to you any analysis, data, assumptions or 24 facts related to this matter.</p> <p>25 A. So then, okay, that includes data. Yes.</p>
<p style="text-align: right;">Page 11</p> <p>1 Videoconference Deposition Of Dr. Moon Duchin, was 2 marked)</p> <p>3 BY MR. GORE:</p> <p>4 Q. And can you see anything on your screen?</p> <p>5 A. No. Should I be looking in Exhibit 6 Share?</p> <p>7 Q. You can or I can do a quick screen share 8 here. How about that? Can you see that?</p> <p>9 A. I see the screen share, yes.</p> <p>10 Q. And this is the notice of your 11 deposition which was issued for your deposition 12 today. Have you seen this document before?</p> <p>13 A. I attempted to review everything that 14 was in the folder of materials that was provided, so 15 I suspect that I at least looked at this.</p> <p>16 Q. And as part of this document we asked 17 you to produce documents related to your opinion in 18 this case. And that's part of the subpoena here all 19 the way at the end of this, Exhibit A. Have you 20 reviewed this, to your memory?</p> <p>21 A. I have looked through it.</p> <p>22 Q. I'm going to ask you about a couple of 23 these things. Letter G asks for copies of all 24 materials provided to you by plaintiff's counsel or 25 plaintiffs or their officers, employees or</p>	<p style="text-align: right;">Page 13</p> <p>1 I was provided with an electoral data set for South 2 Carolina. That was many months ago, before -- 3 before the work had started on the congressional 4 district, specifically.</p> <p>5 Another matter that we discussed was the 6 timeline of when various demonstrative maps had been 7 introduced. Other than that -- those are the main 8 things that occur to me as facts or data that were 9 provided by counsel, as opposed to being part of 10 widely available public record.</p> <p>11 Q. Did counsel provide you any of the other 12 expert reports in this case?</p> <p>13 A. I have seen expert reports from Sean 14 Trende. I have not seen other plaintiff's expert 15 reports.</p> <p>16 Q. And after you collected the documents in 17 response to the subpoena, what did you do with them?</p> <p>18 A. Let me see. I discussed with counsel 19 which documents I thought were responsive to the 20 subpoena, and then my understanding is that they 21 handed over to you a packet of documents and 22 communications.</p> <p>23 Q. Okay. And did you provide to counsel 24 all documents that were responsive to the subpoena?</p> <p>25 A. Yes, to the best of my ability.</p>

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<p style="text-align: right;">Page 14</p> <p>1 Q. Thank you. I would like to ask you a 2 few more questions about your background. Can you 3 please describe for us your educational background 4 after high school?</p> <p>5 A. Sure. I was an undergraduate at Harvard 6 University and formally graduated in 1998 with 7 degrees in Mathematics and Women Studies.</p> <p>8 I matriculated in 1998 at the University 9 of Chicago where I did my graduate work. I have 10 Master's degree in Mathematics and a PhD in Math 11 from Chicago from 2005. So that's my educational 12 background. After that I would characterize it as 13 professional work.</p> <p>14 Q. And was legislative redistricting part 15 of your studies during your educational background, 16 during your university studies and graduate work?</p> <p>17 A. No, I did not study redistricting as an 18 undergrad or graduate student.</p> <p>19 Q. And can you tell me your professional 20 experience and background since you finished your 21 graduate studies?</p> <p>22 A. Sure. I will be brief. Tell me if you 23 want more detail. After graduating from East 24 Chicago I held post-doctoral positions at the 25 University of California Davis and University of</p>	<p style="text-align: right;">Page 16</p> <p>1 redistricting start in 2016 or at some other time? 2 A. That's right, in 2016. 3 Q. And have you written any peer-reviewed 4 publications about redistricting? 5 A. Yes, quite a few. Probably -- we can 6 look at my CV and count, but at least ten. 7 Q. And are those all listed in our CV? 8 A. Yes. My CV is as current as I can make 9 it.</p> <p>10 Q. Thank you. Have you written any 11 peer-reviewed publications about South Carolina? 12 A. South Carolina has been mentioned in my 13 peer-reviewed publications, but there were none that 14 focused on South Carolina exclusively.</p> <p>15 Q. Have you submitted any works for peer 16 review that were then rejected and not published? 17 A. Oh. And never published? Or do you 18 mean has a journal ever declined to publish my work? 19 Q. Has a journal ever declined to publish 20 your work? 21 A. Absolutely. 22 Q. How many times has that happened? 23 A. Oh, I don't know. But it's quite 24 frequent to have one or more rejections before a 25 paper is placed. I wouldn't be able to count, off</p>
<p style="text-align: right;">Page 15</p> <p>1 Michigan, along with visits to the Mathematical 2 Sciences Research Institute and a few others. 3 In 2011 I started my tenure track 4 position at Tufts University, and after a few 5 promotions I am now a full professor at Tufts in 6 mathematics with several affiliate appointments. 7 And I'm a senior fellow in the College of Civic Life 8 at Tufts, which is called Tisch College at Tufts. 9 Q. And since obtaining your PhD what areas 10 of research and scholarship have you concentrated 11 on? 12 A. Well, in pure mathematics my specialties 13 are low dimensional geometric topology. Apologies 14 in advance to the court reporter for having to 15 decode that. 16 I studied dynamical systems and discrete 17 geometry and group theory. 18 I also work in the area called Science 19 Technology and Society and directed the program in 20 that area here, at Tufts, for five to six years. 21 Since 2016 I have had an intense 22 research focus in areas connected to voting, 23 especially social choice theory and redistricting. 24 Q. And so did your interest in 25 redistricting -- your scholarship interest in</p>	<p style="text-align: right;">Page 17</p> <p>1 the top of my head. 2 Q. And how many articles have you submitted 3 that were never published by any journal? 4 A. I cannot think of any articles that were 5 never either published in their original form or in 6 a revised form. I have a few that are still in 7 submission and so I can't say for sure where they 8 will land, but I can't -- nothing comes to mind that 9 was rejected and never revived. 10 Q. And do your articles that are still in 11 submission address legislative redistricting at all? 12 A. Yes, several do. 13 Q. In how many cases have you been an 14 expert witness? 15 A. There is a list on the CV. And so to be 16 fully accurate, I would be happy to pull that up. 17 But I can tell you that I have written reports 18 and/or provided testimony or deposition recently, in 19 the last year, in North Carolina, Pennsylvania, 20 Wisconsin, Alabama, South Carolina and Texas. 21 Q. And how many of those cases were 22 redistricting cases? 23 A. All of them. 24 Q. And have you testified in court in any 25 of those cases?</p>

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<p style="text-align: right;">Page 18</p> <p>1 A. Yes.</p> <p>2 Q. Which ones?</p> <p>3 A. I testified in federal district court in</p> <p>4 the Alabama case. I testified in state court in</p> <p>5 North Carolina and in Pennsylvania. I believe</p> <p>6 that's it so far.</p> <p>7 Q. So you have not testified in court in</p> <p>8 Texas?</p> <p>9 A. Not yet.</p> <p>10 Q. How about Wisconsin?</p> <p>11 A. No. There ended up being no expert</p> <p>12 testimony in Wisconsin.</p> <p>13 Q. Can you briefly describe to me what your</p> <p>14 specific area of expertise is when it comes to</p> <p>15 redistricting?</p> <p>16 A. I will try, although I think my</p> <p>17 redistricting interests are quite broad. But I</p> <p>18 think my particular expertise is in computational</p> <p>19 methods, on one hand. And on the other hand, the</p> <p>20 area that I called STS earlier, which also looks at</p> <p>21 historical and social aspects of voting rights and</p> <p>22 redistricting.</p> <p>23 Q. Has any court ever excluded your expert</p> <p>24 testimony?</p> <p>25 A. No.</p>	<p style="text-align: right;">Page 20</p> <p>1 those examples of when that has happened?</p> <p>2 A. Sure. One example is in Alabama where I</p> <p>3 drew four demonstrative maps that were called: Plan</p> <p>4 A, B, C and D that were entered as Gingles 1</p> <p>5 Demonstration Plans.</p> <p>6 In numerous of the cases we have</p> <p>7 discussed I have drawn alternative demonstrative</p> <p>8 maps that have played various roles in the</p> <p>9 litigation. I can give more examples if that is of</p> <p>10 interest.</p> <p>11 I have also played a role sometimes in</p> <p>12 assisting various land-drawing bodies outside of the</p> <p>13 litigation context. For example, I provided data</p> <p>14 support to the so-called People's Maps Commission in</p> <p>15 Wisconsin which was a commission convened, I</p> <p>16 believe, by gubernatorial executive order. And as</p> <p>17 part of that role I provided the Commission with</p> <p>18 dozens of demonstrative maps to consider and review.</p> <p>19 Those are examples. If you would like</p> <p>20 more examples of that kind, I can try to drill</p> <p>21 deeper into the various ways that I have drawn maps,</p> <p>22 but suffice it to say it's something I do</p> <p>23 frequently.</p> <p>24 Q. I want to ask you a little bit about</p> <p>25 this Alabama case where you did the four -- I think</p>
<p style="text-align: right;">Page 19</p> <p>1 Q. And do you know if any of the cases in</p> <p>2 which you testified your testimony was criticized by</p> <p>3 a court?</p> <p>4 A. Can you be more precise about what</p> <p>5 criticized might mean?</p> <p>6 Q. Has there ever been a case where a court</p> <p>7 has not accepted your testimony in its ruling?</p> <p>8 A. Not in entirety. As I recall, in the</p> <p>9 Pennsylvania case the -- let's see if I can get this</p> <p>10 right. Before the case was taken up but the State</p> <p>11 Supreme Court there was testimony heard by a single</p> <p>12 judge who then became a special master. And in her</p> <p>13 report as a special master, I believe she accepted</p> <p>14 three dozen points of my testimony and cast doubt on</p> <p>15 two. Those numbers should be taken as approximate.</p> <p>16 Q. Thank you. Are you a map drawer?</p> <p>17 A. I have, at times, drawn maps for various</p> <p>18 land drawing bodies and sometimes in litigation.</p> <p>19 Q. Have you ever been qualified as an</p> <p>20 expert in map drawing?</p> <p>21 A. I believe in Alabama I was qualified as</p> <p>22 an expert in demography and possibly cartography,</p> <p>23 but I would have to check the records to be sure.</p> <p>24 Q. You mentioned that you, at various</p> <p>25 times, had drawn maps. Can you walk me through</p>	<p style="text-align: right;">Page 21</p> <p>1 you said you did four demonstrative maps, A, B, C</p> <p>2 and D on a Gingles 1 analysis?</p> <p>3 A. Yes.</p> <p>4 Q. So in those maps you were drawing</p> <p>5 majority-minority districts. Is that correct?</p> <p>6 A. Well, yes. Let me qualify that by</p> <p>7 saying that part of the question was how to count</p> <p>8 which group was at issue, and so I provided</p> <p>9 demographic analysis for those reports with various</p> <p>10 bases of population. But it is true that all four</p> <p>11 of those plans were -- had two districts in which</p> <p>12 there was a majority of so-called Any Part Black</p> <p>13 Voting Age Population. Is that responsive to your</p> <p>14 question?</p> <p>15 Q. Yes, it is, thank you. And did the</p> <p>16 Court in Alabama review or analyze your proposed</p> <p>17 maps?</p> <p>18 A. Yes, they did.</p> <p>19 Q. And what did the court say, if anything,</p> <p>20 about those maps?</p> <p>21 A. So the court generally was extremely --</p> <p>22 found my testimony to be extremely persuasive and</p> <p>23 credible. And the maps were part of that testimony.</p> <p>24 If you are asking for specific comments</p> <p>25 evaluating the maps, I would -- I would need to have</p>

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<p style="text-align: right;">Page 22</p> <p>1 the document -- the decision pulled up so that we 2 could review them, because I wouldn't want to try to 3 paraphrase without them.</p> <p>4 Q. Thank you. I appreciate that. I'm just 5 trying to get a general sense right now.</p> <p>6 Did the court adopt any of your maps as 7 a remedy in that case?</p> <p>8 A. They did not. They, instead, asked for 9 the state to -- and here I will try to paraphrase -- 10 draw either a second district that is majority Black 11 or something very much like it. I believe their 12 wording was something in that direction, indicating 13 that the second remedial district need not be 14 majority Black.</p> <p>15 Q. And was this part of Alabama litigation 16 that was stayed by the U.S. Supreme Court?</p> <p>17 A. Yes, indeed.</p> <p>18 Q. Now, you mentioned numerous other cases 19 in which you have drawn maps for various purposes. 20 Is that right?</p> <p>21 A. Yes.</p> <p>22 Q. And in any of those cases were the maps 23 you drew submitted to the court?</p> <p>24 A. You mean as exhibits?</p> <p>25 Q. As exhibits or as evidence in the case.</p>	<p style="text-align: right;">Page 24</p> <p>1 districting principles, looked at racial fairness 2 frameworks. So it was a fairly extensive piece of 3 work.</p> <p>4 Q. And is the North Carolina Congressional 5 case the case in which the U.S. Supreme Court 6 recently granted certiorari? If you know.</p> <p>7 A. Yes, that is correct. To my 8 understanding. I should always qualify that I am 9 not aware.</p> <p>10 Q. And you're much better off for it, I'm 11 sure.</p> <p>12 How about the Pennsylvania case? What 13 was the general topic or subject of your testimony 14 in that case?</p> <p>15 A. Again, that focused on partisan fairness 16 but did also look at minority opportunity to elect, 17 as did North Carolina, and traditional districting 18 principles.</p> <p>19 I will mention that in both Pennsylvania 20 and North Carolina I provided analysis connected to 21 a demonstrative map that I did not draw myself. My 22 role was to evaluate rather than draw in those 23 states.</p> <p>24 Q. And who drew the maps that you 25 evaluated?</p>
<p style="text-align: right;">Page 23</p> <p>1 A. I'm thinking back through. I am not 2 sure. I would like to give a technically correct 3 answer, and I'm just not sure if they were submitted 4 as exhibits.</p> <p>5 Q. And then you mentioned the People's Maps 6 Commission in Wisconsin. Do I have that right, that 7 name correct?</p> <p>8 A. PMC. That is correct.</p> <p>9 Q. PMC. Terrific. And I think you said 10 you provided data support. Did you also draw maps 11 for the PMC?</p> <p>12 A. As I mentioned, I gave them dozens of 13 demonstrative maps to consider. Not to adopt, but 14 to consider in terms of weighing alternative options 15 for drawing.</p> <p>16 Q. And what was the subject of your 17 testimony in the North Carolina case?</p> <p>18 A. In the North Carolina case all three 19 levels of redistricting plan were being challenged, 20 the Congressional, State Senate and State House 21 districts. And my role was, in large part, to 22 examine partisan fairness considerations at all 23 three levels. But my report -- my reports, I 24 believe there may have been as many as five in that 25 case, went well beyond that, looked at traditional</p>	<p style="text-align: right;">Page 25</p> <p>1 A. In Pennsylvania the map was drawn by the 2 governor's office, although to this day I do not 3 know the identities of the people who actually sat 4 at the computer to draw it.</p> <p>5 In North Carolina I did not know who 6 drew the map when I evaluated it, but it came out in 7 the course of the trial that it had been drawn by a 8 team that included both attorneys and data 9 scientists.</p> <p>10 Q. What was the Wisconsin case about?</p> <p>11 A. In Wisconsin, like in North Carolina, 12 there was a challenge to the Congressional districts 13 as well as the State Senate and Assembly districts. 14 The issues that were important in that case were 15 issues of -- well, the State Supreme Court in 16 Wisconsin centered a principle of least change. So 17 that was a very important issue at the heart of that 18 case, thinking about what least change might 19 mean and how to measure it. But issues of partisan 20 fairness and also of minority opportunity to elect 21 were also important.</p> <p>22 Q. If you know, was that an impasse case or 23 a partisan gerrymandering case?</p> <p>24 A. I do not know. To clarify, by "impasse" 25 you mean that the split control meant that no map</p>

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<p>1 had been enacted and approved?</p> <p>2 Q. That's right.</p> <p>3 A. I wouldn't want to try to guess how to</p> <p>4 classify the case correctly in legal terms.</p> <p>5 Q. And you have never been an expert in a</p> <p>6 nonredistricting case. Is that right?</p> <p>7 A. That's correct.</p> <p>8 Q. If I have done this correctly, you</p> <p>9 should be able to see your report on the screen.</p> <p>10 Can you see your report?</p> <p>11 A. I can. And I also have a local copy.</p> <p>12 Q. Great. And I have marked this as</p> <p>13 Exhibit 2.</p> <p>14 (Exhibit No. 2, April 11, 2022 Report on South</p> <p>15 Carolina Congressional Districts, was marked)</p> <p>16 BY MR. GORE:</p> <p>17 Q. Is this a report you prepared in this</p> <p>18 case?</p> <p>19 A. Yes.</p> <p>20 Q. How many reports have you prepared in</p> <p>21 the case?</p> <p>22 A. For Congressional districts there were</p> <p>23 two, dated April 11th and May 4th.</p> <p>24 Q. How much time did you spend preparing</p> <p>25 this report, this April 11th report?</p>	<p>1 supervision. The analysis was done by me.</p> <p>2 Q. And I believe your report says that</p> <p>3 you --</p> <p>4 A. Actually --</p> <p>5 Q. -- are being paid -- sorry. Go ahead.</p> <p>6 A. Can I add to that?</p> <p>7 Q. Please.</p> <p>8 A. The other element of research support</p> <p>9 that I received was assistance reviewing the public</p> <p>10 hearing testimony, just to be complete in my answer.</p> <p>11 Q. I see. So can you give me little bit</p> <p>12 more information about what that review of the</p> <p>13 public testimony entailed?</p> <p>14 A. I personally read all of the public</p> <p>15 testimony that was presented by the State in written</p> <p>16 form on the State's website. There was a great deal</p> <p>17 of it, many, many pages. And in order to attempt a</p> <p>18 more comprehensive review I also had a research</p> <p>19 assistant review the same corpus and we discussed it</p> <p>20 together.</p> <p>21 Q. And did your research assistant prepare</p> <p>22 any summaries or excerpts from the testimony?</p> <p>23 A. We, I would say, worked together to flag</p> <p>24 aspects that seemed relevant.</p> <p>25 Q. So you don't recall one way or the</p>
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<p>1 A. I couldn't say, but many hours.</p> <p>2 Q. Do you recall how many drafts of this</p> <p>3 report you went through?</p> <p>4 A. I have what I would call a continuous</p> <p>5 editing process, so I don't think about the process</p> <p>6 in terms of discreet drafts. But, you know, I</p> <p>7 worked on this over the course of weeks.</p> <p>8 Q. Did you get any assistance in preparing</p> <p>9 this report?</p> <p>10 A. I do have research assistants working</p> <p>11 under my supervision.</p> <p>12 Q. How many of them worked on this report?</p> <p>13 A. None of them worked on the writing of</p> <p>14 this report, if that's what you mean.</p> <p>15 Q. What about the analysis behind this</p> <p>16 report or any of the data support behind this</p> <p>17 report?</p> <p>18 A. Right. I would say two research</p> <p>19 assistants provided support.</p> <p>20 Q. And what was the nature of that support?</p> <p>21 A. Data curation, as I call it. So</p> <p>22 creating a data product that works with our general</p> <p>23 software and techniques and writing code and running</p> <p>24 analysis -- well, I shouldn't say running analysis.</p> <p>25 I should say running computational scripts under my</p>	<p>1 other, or your research assistant did not prepare</p> <p>2 any summaries or excerpts or copy and pastes for any</p> <p>3 of those -- any of those bodies of testimony?</p> <p>4 A. I would say the copy and paste was done</p> <p>5 by me.</p> <p>6 Q. And I believe you said that in your</p> <p>7 report that you're being compensated at \$300 an</p> <p>8 hour. Is that right?</p> <p>9 A. We can pull that up, but that sounds</p> <p>10 right.</p> <p>11 Q. Sure. I'll see if I can find it. Right</p> <p>12 here?</p> <p>13 A. Yes. There we are.</p> <p>14 Q. Do you know how much -- approximately</p> <p>15 how much you have been paid to date for your work in</p> <p>16 this matter?</p> <p>17 A. I don't, but I am aware that the</p> <p>18 invoices were turned over to you in the last few</p> <p>19 weeks. I think it's the case -- I'm confident that</p> <p>20 the invoices don't separate the South Carolina House</p> <p>21 District work from the South Carolina Congressional</p> <p>22 District work. So it's hard for me to identify</p> <p>23 specifically how many hours and how much</p> <p>24 compensation attached to Congressional districts.</p> <p>25 Q. So your billing in this matter has been</p>

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<p style="text-align: right;">Page 30</p> <p>1 for South Carolina, generally, though, than for 2 either aspect of the case.</p> <p>3 A. That's right.</p> <p>4 Q. Is that fair?</p> <p>5 A. That's correct.</p> <p>6 Q. So section 1.2 of your report identifies 7 certain materials that you relied on. You have the 8 Census data, including other products from the 9 Census Bureau, like the ACS. You looked at the 10 House of Representatives and Senate Guidelines; 11 also, at the Congressional plan and publicly 12 submitted alternative plans and 13 community-of-interest testimony. Were there any 14 other materials that you relied on or used in 15 preparing this report?</p> <p>16 A. Yes. I would say that in the review to 17 turn over materials I realized that I had 18 inadvertently omitted electoral data from this list. 19 And as I mentioned, electoral data was provided to 20 me by counsel many months ago.</p> <p>21 Q. And can you recall what that electoral 22 data was in more detail?</p> <p>23 A. Yes. It was a shapefile of precincts 24 with election results joined.</p> <p>25 Q. Do you recall which election results?</p>	<p style="text-align: right;">Page 32</p> <p>1 conclusion. And I would say that I try to carefully 2 scope my role as one that provides evidence. So I 3 do think that I provide evidence that might be 4 helpful for reaching a conclusion like that. But 5 that is my sense of my role here, is quantitative 6 analysis and evidence.</p> <p>7 Q. Will you be offering an opinion at trial 8 as to whether or not the enacted plan intentionally 9 discriminates on the basis of race?</p> <p>10 A. I find -- I think I would try very 11 studiously to construct my response as saying that I 12 find evidence that supports that conclusion.</p> <p>13 Q. But will you offer the ultimate opinion 14 one way or the other whether the enacted plan 15 intentionally discriminates?</p> <p>16 A. That sounds, to me, like a bit further 17 than I like to go.</p> <p>18 Q. Is that a no, then, the answer to my 19 question?</p> <p>20 A. Well, you're asking about a future 21 statement and so I cannot conclusively describe all 22 possible future statements, but I can describe my 23 sense of my role and my plans for how I will express 24 them.</p> <p>25 Q. And as you sit here today, do you hold</p>
<p style="text-align: right;">Page 31</p> <p>1 A. I do not. But I only used the statewide 2 elections that are referenced in my May 4th report.</p> <p>3 Q. And other than Mr. Trende's reports 4 which you reviewed, I believe you said you have not 5 reviewed any other expert reports in the case. Is 6 that right?</p> <p>7 A. That is right. To be clear, I spent a 8 substantial amount of time reviewing Sean Trende's 9 initial report but had missed the rebuttal report. 10 So I have now reviewed it but have not spent a long 11 time with the rebuttal report.</p> <p>12 Q. Thank you. And both your initial report 13 and your rebuttal report offer testimony on the 14 South Carolina Congressional Map enacted earlier 15 this year. Correct?</p> <p>16 A. Well, I'm not sure it's testimony, per 17 se, but they offer analysis.</p> <p>18 Q. Analysis. Okay. Great. And I'm going 19 to refer to that plan as the "enacted plan." Is 20 that okay?</p> <p>21 A. Yes.</p> <p>22 Q. Thank you. Do either of your reports 23 conclude that the enacted plan intentionally 24 discriminates on the basis of race?</p> <p>25 A. That sounds, to me, like a legal</p>	<p style="text-align: right;">Page 33</p> <p>1 the opinion that the enacted plan intentionally 2 discriminates on the basis of race?</p> <p>3 A. I hold the opinion that there is 4 compelling evidence to support that conclusion.</p> <p>5 Q. And do either of your reports conclude 6 that race predominated over traditional district 7 principles in the enacted plan?</p> <p>8 A. Let me stipulate that -- so that I don't 9 speak very repetitively, that we can maybe shorthand 10 the phrase "evidence in support of," but let me just 11 stipulate that I always intend to provide evidence 12 in support of various legal conclusions and not to 13 provide legal conclusions myself. Having said that, 14 I do offer evidence of the predominance of racial 15 concerns over various kinds of other principles.</p> <p>16 Q. And as you sit here today do you hold an 17 opinion that race predominated over the -- over 18 traditional districting criteria in the enacted 19 plan?</p> <p>20 A. Let's say I do hold the opinion that 21 other principles were subordinated to concerns that 22 are -- that involve race.</p> <p>23 Q. And what are those concerns that involve 24 race?</p> <p>25 A. If we could look at my report, we can</p>

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<p style="text-align: right;">Page 34</p> <p>1 look at section 7 on page 25 of my initial report. 2 So in this section I look at what I call: 3 "Electoral opportunity for Black voters." And I do 4 think that there is evidence that electoral 5 opportunity for Black voters has been a concern in 6 the creation of the map. And, in particular, I 7 offer evidence that it predominates over other 8 partisan considerations.</p> <p>9 Q. Are there any other concerns that 10 involve race that you believe predominate over 11 traditional districting criteria?</p> <p>12 A. Could I ask you to rephrase the 13 question?</p> <p>14 Q. Sure. I think what you said a couple 15 answers ago was that you believe that concerns that 16 involve race predominated over traditional criteria, 17 and I asked you what those are.</p> <p>18 You said electoral opportunity for Black 19 voters. I'm just curious if there are any other 20 concerns or issues that touch on race or involve 21 race, to use your phrase, that are addressed in your 22 report or form part of your opinions.</p> <p>23 It's not meant to be a trick question. 24 I'm just trying to understand what you meant by 25 concerns that involve race.</p>	<p style="text-align: right;">Page 36</p> <p>1 visualization that is shaded and where the intensity 2 of the shading reflects some numerical quantity. 3 And that's what we see here.</p> <p>4 Q. And what is being depicted in Figure 1? 5 A. This is the share of Black voting age 6 population in every VTD. Those are often informally 7 called precincts, so in every precinct in South 8 Carolina.</p> <p>9 Q. And which data did you use to determine 10 the BVAP in precincts for Figure 1?</p> <p>11 A. This is decennial census data from the 12 PL94-171.</p> <p>13 Q. And on page 6 you have -- are these also 14 choropleths?</p> <p>15 A. Yes, it's fair to call these 16 choropleths.</p> <p>17 Q. Figure 2. And here is this depicting 18 changes in BVAP by county over a period of time? Is 19 that right?</p> <p>20 A. That's correct.</p> <p>21 Q. And that's according to the American 22 Community Survey estimates. Is that right?</p> <p>23 A. Yes. So this is, on top, by county; on 24 the bottom, by tract. This is showing the change 25 between the ACS estimates of 2010 and 2019.</p>
<p style="text-align: right;">Page 35</p> <p>1 A. Sure. I understand. I think we could 2 look at my response report of May 4th on page 2 and 3 look at the first bullet of that.</p> <p>4 Q. Okay. We can get to that.</p> <p>5 A. Okay. But just to say, there I do 6 discuss the idea that the so-called repair of 7 counties and precincts in the State's plan is 8 selective and fails to address areas of particular 9 salients for Black communities. That would be 10 another example.</p> <p>11 Q. And we will walk through all this in a 12 little bit more detail.</p> <p>13 A. Sure.</p> <p>14 Q. All right. I want to turn to page 5 of 15 your opening report --</p> <p>16 A. Yes.</p> <p>17 Q. -- which I have up on the screen. I 18 encountered a new word in your report that I had 19 never seen before, at least in my memory. Under 20 Figure 1 you use this word "choropleth." Did I say 21 that correctly?</p> <p>22 A. You did. It's choropleth.</p> <p>23 Q. Okay. Can you explain to me what a 24 choropleth is?</p> <p>25 A. Gladly. A choropleth is a kind of map</p>	<p style="text-align: right;">Page 37</p> <p>1 Q. And Figure 1 was depicting a percentage?</p> <p>2 A. That's right.</p> <p>3 Q. And Figure 2 appears to depict the total 4 number of people. Is that right?</p> <p>5 A. That's right. As I would phrase it, 6 it's a share in Figure 1 and a count in Figure 2.</p> <p>7 Q. And in Figure 2 is this only voting age 8 population or is this total population?</p> <p>9 A. It says that it's voting age population, 10 and so I hope that's correct.</p> <p>11 Q. Is there a reason you used the ACS data 12 rather than the decennial census data to generate 13 Figure 2?</p> <p>14 A. The pause is me trying to remember the 15 circumstances of the creation of this figure. I'm 16 not completely sure why that choice was made -- why 17 I made that choice, but I will say, as you know, 18 that census data was delayed this year.</p> <p>19 The ACS, or American Community Survey, 20 had particular difficulty with its 2020 data, so 21 2019 -- in fact, the Census Bureau has released 22 communications indicating that the 2020 ACS was 23 compromised by COVID and other factors. And so 24 although I don't, as we sit here, remember the exact 25 thought process, I suspect that I was trying to make</p>

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<p style="text-align: right;">Page 38</p> <p>1 an apples-to-apples comparison between ACS releases 2 that were done with similar methodology in 2010 and 3 2019.</p> <p>4 Q. Was the decennial census data available 5 when you drafted this report?</p> <p>6 A. Definitely.</p> <p>7 Q. And could you have generated Figure 2 8 using the decennial census data?</p> <p>9 A. Yes. And I have every reason to believe 10 it would be similar.</p> <p>11 Q. But you did not, at least, include that 12 in your report.</p> <p>13 A. That's right.</p> <p>14 Q. And do you recall whether you actually 15 did, in fact, generate a version of Figure 2 with 16 the decennial census data?</p> <p>17 A. I do not recall, but I can assure you 18 that this is not cherry-picked to give a different 19 impression. I always try to do the best and most 20 forthcoming data practice as possible. So it is 21 assuredly not the case that a decennial image would 22 show a substantially different result and this was 23 chosen to give a different impression.</p> <p>24 Q. But as you sit here today, you don't 25 know how Figure 2 would look if you had used</p>	<p style="text-align: right;">Page 40</p> <p>1 I just would like to get an answer to this question 2 for the record. You don't know, as you sit here 3 today, what Figure 2 would look like with decennial 4 census data. Is that correct?</p> <p>5 A. I have every reason to believe it would 6 look similar.</p> <p>7 Q. But you don't know that. Correct?</p> <p>8 A. I wouldn't want to assert that with 9 certainty.</p> <p>10 Q. So the answer is you don't know.</p> <p>11 A. I have answered you as best I can.</p> <p>12 Q. Let's go to page 7 of your report where 13 you discuss redistricting criteria. And is it 14 correct that this section, or part 3, is a review of 15 the redistricting criteria in the Guidelines issued 16 by the House and Senate?</p> <p>17 A. Yes, that's correct. And I also attempt 18 to contextualize that sometimes by appealing to 19 sources beyond the State's Guidelines. But it is 20 correct to say that the focus is the State's 21 Guidelines.</p> <p>22 Q. And you divided the criteria here into 23 first-tier and second-tier requirements. Is that 24 right?</p> <p>25 A. Yes, following the Guidelines</p>
<p style="text-align: right;">Page 39</p> <p>1 decennial census data instead. Is that right?</p> <p>2 A. Well, the only thing I can assure you is 3 that it's not the case that I compared them, they 4 looked different and I chose this one to give a 5 different impression. I can assure you that's not 6 the case.</p> <p>7 Q. Okay. But you can't -- you don't know, 8 one way or the other, what Figure 2 would look like 9 with decennial census data, as you sit here today?</p> <p>10 A. I don't -- I don't have it in my mind. 11 I will tell you some reasons that ACS data might be 12 of interest, as opposed to decennial census data. 13 So ACS data -- for example, this figure says it's 14 BVAP, as in Black voting age population. It doesn't 15 say that it's BCVAP, as in Black citizen voting age 16 population.</p> <p>17 But one reason to use ACS data sometimes 18 is to look at citizen voting age share. That 19 doesn't appear to be what I have done here, but I'm 20 describing reasons that one might choose the ACS as 21 a data product rather than the decennial census. 22 Other than that, I am not able, as I sit here, to 23 account for why this is done with ACS, except to 24 repeat that I assure you it's not cherry-picked. 25 Q. I appreciate where you're coming from.</p>	<p style="text-align: right;">Page 41</p> <p>1 themselves.</p> <p>2 Q. Okay. Did either the House or the 3 Senate Guidelines divide the criteria into first and 4 second tiers?</p> <p>5 A. Yes. And I describe that here. Let me 6 try to remember whether it was House or Senate, but 7 one of the two -- and we can pull them up and 8 verify -- clearly indicates that the second set may 9 not compromise the first. So that does follow the 10 Guidelines. Would you like us to find that in the 11 Guidelines?</p> <p>12 Q. Yeah. And I'm going to pull those up if 13 I can figure out how to do that real quick. Bear 14 with me for one second, if you don't mind.</p> <p>15 A. It's the House Guidelines, just to say.</p> <p>16 Q. Okay. Can you see the House 17 Redistricting Guidelines on your screen?</p> <p>18 A. Yes. And I have a local copy.</p> <p>19 Q. And are these the House Redistricting 20 Guidelines we have been discussing and that you 21 reference in your report?</p> <p>22 A. Yes.</p> <p>23 (Exhibit No. 3, 2021 Guidelines and Criteria for 24 Congressional and Legislative Redistricting, was 25 marked)</p>

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<p>1 BY MR. GORE:</p> <p>2 Q. I have marked these as Exhibit 3. Can</p> <p>3 you point me to where the House Redistricting</p> <p>4 Guidelines divide criteria into first and second</p> <p>5 tiers?</p> <p>6 A. Yes. Although to be clear, "tier" is my</p> <p>7 language. Their language is Priority of Criteria,</p> <p>8 and it's Section IX. So I'm specifically referring</p> <p>9 to IX a. where they say: "In establishing</p> <p>10 Congressional and Legislative districts, all</p> <p>11 criteria identified in these guidelines should be</p> <p>12 considered. However, if there is a conflict among</p> <p>13 the requirements of these guidelines, the</p> <p>14 requirements addressed in Sections I, II, III and IV</p> <p>15 herein should be given priority." So those are the</p> <p>16 ones that I attempted to summarize as first tier.</p> <p>17 Q. Got it. One of those is section III.</p> <p>18 Is that right, the requirements addressed in section</p> <p>19 III?</p> <p>20 A. Correct, I, II, III and IV.</p> <p>21 Q. And section III, back here on page 1,</p> <p>22 refers to South Carolina Constitutional Laws of the</p> <p>23 State and the opinions of the South Carolina Supreme</p> <p>24 Court.</p> <p>25 A. Yes.</p>	<p>Page 42</p> <p>1 whether -- to opine on whether state law addresses</p> <p>2 those factors. I can only talk about the way</p> <p>3 that -- I only intend to talk about the way that</p> <p>4 they are described in this document.</p> <p>5 Q. And other than paragraph IX of the House</p> <p>6 Guidelines, was there anything else you did or used</p> <p>7 to determine which criteria would be first tier and</p> <p>8 which criteria would be second tier?</p> <p>9 A. I intended to follow their division.</p> <p>10 Q. And did you discuss this division with</p> <p>11 any members of the South Carolina General Assembly?</p> <p>12 A. No.</p> <p>13 Q. Or any legislative staff?</p> <p>14 A. I did not.</p> <p>15 Q. Let's talk about 3.1, first-tier</p> <p>16 requirements, for just a moment.</p> <p>17 A. Yes.</p> <p>18 Q. Minority opportunity. I believe you say</p> <p>19 that the guidelines clearly contemplate the use of</p> <p>20 race data.</p> <p>21 A. I do say that.</p> <p>22 Q. And is it your opinion that the General</p> <p>23 Assembly was obligated to use race data to draw the</p> <p>24 congressional line?</p> <p>25 A. I think that question goes beyond my</p>
<p>1 Q. And were any of the criteria you</p> <p>2 identified as first tier in your report state law</p> <p>3 criteria? I'm happy to pull that back up if you</p> <p>4 would like.</p> <p>5 A. I have it here. This might be somewhat</p> <p>6 awkwardly constructed, but I do say in the first</p> <p>7 paragraph, first sentence of section 3.2: "The</p> <p>8 previous criteria I through IV of the House</p> <p>9 Guidelines are rooted in the Constitution and in</p> <p>10 federal and state law."</p> <p>11 Q. That's right here around 3.2? Is that</p> <p>12 what you're referring to?</p> <p>13 A. That's right, the first sentence.</p> <p>14 Q. And these other second-tier requirements</p> <p>15 Contiguity, Compactness, Communities of interest and</p> <p>16 political boundaries, are any of those requirements</p> <p>17 rooted in state law?</p> <p>18 A. Well, I'm not in a good position to</p> <p>19 answer that as a matter of fact about state law, so</p> <p>20 I can only describe and I only mean to describe how</p> <p>21 they are discussed in the House Guidelines. So in</p> <p>22 the House Guidelines those lower-ranked criteria are</p> <p>23 separate from the section that discusses the state</p> <p>24 law.</p> <p>25 I wouldn't go so far as to tell you</p>	<p>Page 43</p> <p>1 expertise, although I would note that the -- again,</p> <p>2 treating this document, in itself it does assert --</p> <p>3 that is the House Guidelines, treating the House</p> <p>4 Guidelines as a document -- as a self-contained</p> <p>5 document it does assert that this committee has the</p> <p>6 authority to determine the criteria that the House</p> <p>7 will use. I cannot tell you whether I agree with</p> <p>8 that assertion. I can only tell you that assertion</p> <p>9 is made here.</p> <p>10 Q. And do the Guidelines require the</p> <p>11 General Assembly to use race to draw any district</p> <p>12 lines?</p> <p>13 A. Are they required to use race?</p> <p>14 Let's see. No. This says race may be a</p> <p>15 factor, quoting the Guidelines.</p> <p>16 Q. Do you know whether the General Assembly</p> <p>17 used race to draw any lines in the enacted plan?</p> <p>18 A. I am not able to describe their process.</p> <p>19 Is that what you mean?</p> <p>20 Q. I'm asking as a factual matter. You</p> <p>21 have drawn maps, and I imagine that in your</p> <p>22 experience you may have drawn maps that used or did</p> <p>23 not use race one way or another. Now, do you know</p> <p>24 one way or the other what -- and you may not. You</p> <p>25 may not, and that's fine. I'm just trying to</p>

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<p style="text-align: right;">Page 46</p> <p>1 confirm. I'm trying to understand the scope of your 2 opinion and your testimony.</p> <p>3 A. I understand. To answer that in the 4 most complete manner that I can, I would say there 5 are a few different kinds of procedural activities 6 that can be described as using race. Sometimes 7 people use the phrase to refer to having a data 8 layer visible. In other words, there may be a data 9 layer that shows you -- for example, like the 10 choropleths we looked at before there may be a data 11 layer that shows you how much, for example, Black 12 population or Black voting age population is in 13 every unit. And sometimes people will say I did not 14 use race to mean that they turned that data layer 15 off or did not make it visible. But of course, 16 especially for someone who is intimately familiar 17 with South Carolina's political geography, the basic 18 contours of race and residential patterns may be 19 well known to the line drawer, and it is quite 20 impossible to turn that off in one's mind.</p> <p>21 So that's all context to say that I do 22 not know whether the line drawers had their race 23 layer visible, but I think it would be impossible 24 for them to remove all consideration of race from 25 their minds if they were familiar with the political</p>	<p style="text-align: right;">Page 48</p> <p>1 My first question is about communities of interest 2 and political boundaries. Do the Guidelines treat 3 those as a single factor or as separate factors?</p> <p>4 A. So here there is a slight divergence 5 between the way the House and the Senate Guidelines 6 construct the criteria. Let's see. Let me try to 7 recall how this works.</p> <p>8 So the House Guidelines, as I note here 9 in the last paragraph that you have on your 10 screen -- oh, no. Yes, the last paragraph that you 11 have on your screen, the House Guidelines fold what 12 is usually a separate principle into the category of 13 COIs. That is, political boundaries which are often 14 itemized separately are considered by the House 15 Guidelines to fall under the umbrella of communities 16 of interest. I would not say that this set of 17 Guidelines is the only place I have seen it handled 18 this way, but it is different from the Senate 19 Guidelines which split out respect for counties, 20 cities and towns and VTDs under separate headings.</p> <p>21 Q. And is there a reason that you decided 22 to put them together, as opposed to treat them as 23 separate headings here?</p> <p>24 A. Well, because that was done in the House 25 Guidelines.</p>
<p style="text-align: right;">Page 47</p> <p>1 and demographic geography of South Carolina.</p> <p>2 Q. And what qualifies you to give the 3 opinion as to what may or may not have been in their 4 minds?</p> <p>5 A. Well, I'm certainly qualified to opine 6 that it may or may not have been in their minds. I 7 think that is almost tautological. And I do not 8 presume to say what was, in fact, in their minds. 9 I'm describing a general state of affairs based, as 10 you said, on my experience.</p> <p>11 Q. And so you don't know one way or the 12 other, just to summarize, how the general assembly 13 may or may not have used race in drawing its --</p> <p>14 A. That's correct. I have no knowledge of 15 any procedural details.</p> <p>16 Q. Have you discussed it with any member of 17 the General Assembly?</p> <p>18 A. I have not, to my knowledge, met any 19 member of the General Assembly, whether in person or 20 virtual.</p> <p>21 Q. And how about any staffer?</p> <p>22 A. No.</p> <p>23 Q. And second-tier requirements, I think 24 you list four here, Contiguity, Compactness, 25 Communities of interest and political boundaries.</p>	<p style="text-align: right;">Page 49</p> <p>1 Q. And other than communities of interest, 2 political boundaries, compactness and contiguity, 3 did the Guidelines identify any other requirements 4 for the map drawer to follow or other criteria?</p> <p>5 A. Okay. Right. I would say not 6 requirements, but considerations. There are other 7 considerations that are mentioned; namely, 8 incumbency consideration is section VIII in the 9 House Guidelines and implicit in both sets of 10 Guidelines.</p> <p>11 Let me open the Senate Guidelines to be 12 sure of the wording. Both sets of Guidelines find 13 ways to mention the preservation of cores of prior 14 districts. In the Senate Guidelines it is called 15 Constituent Consistency, section III B. And in the 16 House Guidelines it is referenced in various 17 subtle ways throughout the discussion, but it does 18 not have its own heading.</p> <p>19 (Exhibit No. 4, 2021 Redistricting Guidelines, was 20 marked)</p> <p>21 BY MR. GORE:</p> <p>22 Q. Now, if I have done this correctly I'm 23 displaying Exhibit 4, the Senate Redistricting 24 Guidelines. Can you see that?</p> <p>25 A. I can. And I have a copy locally.</p>

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<p>1 Q. And is the document the Senate 2 Guidelines documents that we have been discussing? 3 A. It is. 4 Q. And is it the one that's referred to in 5 your report? 6 A. Yes. 7 Q. And I think you were referring to III B, 8 Constituent Consistency? 9 A. Yes. 10 Q. And that expressly says: "Preserving 11 the cores of existing districts"? 12 A. Yes. 13 Q. And E says: "Minimizing Divisions of 14 Voting Precinct Boundaries." Is that right? 15 A. Correct. Yes. 16 Q. I'm trying to take us back to your 17 report. Can you see that now? 18 A. Yes. 19 MR. GORE: Okay. So I'm about to move 20 on to the topic area. Would anyone like to take a 21 break? We have been going for a little bit over an 22 hour. 23 THE WITNESS: I would be happy to take a 24 short break. 25 MR. GORE: How does five minutes sound?</p>	<p>1 such as Pandas and GeoPandas. We sometimes use GIS. 2 Q. What are Pandas or GeoPandas? 3 A. These are packages that handle data 4 frames. And GeoPandas is specifically intended for 5 geographical data. 6 Q. And is that Python software that you 7 used available generally if somebody wants a copy of 8 it? 9 A. Oh, definitely. Python is freely -- 10 it's open source, I think. But it's certainly 11 freely -- it's free and downloadable and widely 12 used. The software, again, we always use 13 open-source software to the fullest extent possible. 14 Q. And in section 4.1 it's called: "Racial 15 demographics." And I believe you used Any Part 16 Black to calculate these demographics. Is that 17 right? 18 A. Correct. 19 Q. Do you know which category the General 20 Assembly has published on its website or used in 21 analyzing plans? 22 A. That is a good question. I do not know. 23 Q. Is there a reason you used Any Part 24 Black, as opposed to some other metric? 25 A. I did use it because my impression is</p>
<p>1 THE WITNESS: Sounds great. 2 (Break In Proceedings) 3 MR. GORE: Let's go back on the record. 4 BY MR. GORE: 5 Q. I will, again, attempt to share my 6 screen so you can see the report. Can you see 7 section 4 of your report? 8 A. Yes. 9 Q. Starting at section 4. And this section 10 is called: "Review of metrics for Congressional 11 maps." What did you do to generate the metrics that 12 are recorded here in section 4? 13 A. So first I took the maps that are listed 14 here which were presented on the website for the 15 State. And then I used the software that has been 16 developed by myself and my lab and collaborators 17 over the last few years to run them through the 18 metrics. Is that what you mean? 19 Q. Yeah. It's a mechanical question, a 20 technical question. What is the software called 21 that you use? 22 A. Well, so we use Python, which is the 23 preferred package in data science; for language, I 24 should say. We frequently, when it comes to 25 geography, use packages that address geographic data</p>	<p>1 that it is becoming the standard in litigation that 2 involves Black electoral opportunity. For example, 3 it was an issue discussed extensively in the Alabama 4 case, and the decision of the district court was 5 that it was clearly the right measure. 6 Q. And could a map drawer use a different 7 measure? 8 A. Could they or should they? 9 Q. Could they? 10 A. Certainly could. 11 Q. And, in your opinion, should they or 12 should they not? 13 A. I -- as a matter of demographics, it can 14 be quite interesting to split population out in 15 different ways. 16 As a matter of legal relevance, here 17 again I was responding, in part, to the district 18 court's decision finding Any Part Black to be the 19 salient category. 20 Q. And did that district court decision 21 hold that map drawers are required to use Any Part 22 Black? 23 A. Certainly not. 24 Q. So this first table, I take it, is just 25 a decimal representation of the BVAPs in each of</p>

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<p style="text-align: right;">Page 54</p> <p>1 these districts. Is that right?</p> <p>2 A. Right. To three decimal places.</p> <p>3 Q. And then the second table here is part</p> <p>4 of Table 1, Table 1A and 1B. But the table at the</p> <p>5 bottom here in Table 1, what does this depict?</p> <p>6 A. Because there is a quite large number of</p> <p>7 plans being discussed, this attempt to summarize the</p> <p>8 number of districts in each over various fairly</p> <p>9 arbitrarily chosen round number demographic lines.</p> <p>10 Q. And are these numbers here cumulative in</p> <p>11 this row? So take previous to 2012.</p> <p>12 A. That is correct. For example, you</p> <p>13 should read this as saying that the South Carolina</p> <p>14 NAACP1 map has two districts over 30 percent BVAP,</p> <p>15 of which one is over 50. That is correct.</p> <p>16 Q. As well as over 40. Right?</p> <p>17 A. Being over 50, yes, is also --</p> <p>18 Q. Is also over 40. So each column is a</p> <p>19 total number of districts in that plan over each</p> <p>20 threshold. Is that right?</p> <p>21 A. That's right. It's a cumulative total.</p> <p>22 Q. So the NAACP plan doesn't have four</p> <p>23 districts. It has three -- or two that are -- tell</p> <p>24 me how many discrete districts or different</p> <p>25 districts are being depicted here for the NAACP1</p>	<p style="text-align: right;">Page 56</p> <p>1 plans. Is that right?</p> <p>2 A. Yes, it is.</p> <p>3 Q. And none of the plans had more than one</p> <p>4 district with over 40 percent BVAP. Is that right?</p> <p>5 A. None of these eleven. Correct.</p> <p>6 Q. And here it looks like, in the last</p> <p>7 column, the majority of plans you assessed had only</p> <p>8 one district with over 30 percent BVAP. Is that</p> <p>9 right?</p> <p>10 A. Let's count. One, two, three, four,</p> <p>11 five, six -- six is, indeed, more than half of</p> <p>12 eleven.</p> <p>13 Q. Let's move to Population deviation.</p> <p>14 A. Yes.</p> <p>15 Q. 4.2. And you have Table 2 here, and in</p> <p>16 the far right-hand column you marked: Top-to-bottom</p> <p>17 deviation?</p> <p>18 A. Yes.</p> <p>19 Q. Is that the same as what is sometimes</p> <p>20 described as total deviation?</p> <p>21 A. I have heard that term used in different</p> <p>22 ways, so I'm trying to be precise. I think top to</p> <p>23 bottom is the clearest.</p> <p>24 Q. And it looks like the enacted plan has a</p> <p>25 top-to-bottom deviation of one person. Is that</p>
<p style="text-align: right;">Page 55</p> <p>1 plan.</p> <p>2 A. Let's take a look at that line and</p> <p>3 compare it back to the previous table, the one</p> <p>4 that's presented above this. So you can see,</p> <p>5 looking at the first table, that there is -- the</p> <p>6 highest BVAP is .528. The next highest is .349.</p> <p>7 And nothing else is over 30.</p> <p>8 And in the way that is reflected in the</p> <p>9 lower table is that there is a total of two</p> <p>10 districts with BVAP over 30, of which one of them is</p> <p>11 over 40 and, indeed, over 50. So there is a total</p> <p>12 of two districts over 30 percent BVAP. So these are</p> <p>13 cumulative totals in the lower table.</p> <p>14 Q. Of the plans you looked at, does this</p> <p>15 chart mean that only three of them had a district</p> <p>16 that was over 50 percent BVAP?</p> <p>17 A. That's right. That is what it says.</p> <p>18 Q. And nine plans out of these eleven had a</p> <p>19 BVAP -- a district with a BVAP over 40 percent. Is</p> <p>20 that right?</p> <p>21 A. Let's count. One, two, three, four,</p> <p>22 five, six, seven, eight, nine, ten, eleven. There</p> <p>23 are eleven in all. And two of them do not, so yes,</p> <p>24 I agree with you, that means nine do.</p> <p>25 Q. And the enacted plan was one of those</p>	<p style="text-align: right;">Page 57</p> <p>1 right?</p> <p>2 A. That's right.</p> <p>3 Q. And the SC-NAACP1 has a top-to-bottom</p> <p>4 deviation of two people, NAACP2 is 4, Harpootlian is</p> <p>5 4, and LWVSC is 5. Is that right?</p> <p>6 A. Yes.</p> <p>7 Q. So do the NAACP1 and 2 plans and</p> <p>8 Harpootlian and League of Women Voters plans comply</p> <p>9 with the Senate Guidelines?</p> <p>10 A. Okay. Let's take a look. The Senate</p> <p>11 Guidelines say, and I quote: "So that the State may</p> <p>12 avoid assuming this additional burden under federal</p> <p>13 law, a congressional districting plan should not</p> <p>14 have population deviations greater than 1 percent."</p> <p>15 And I believe it is correct to say that they are</p> <p>16 talking about top to bottom, although I could look.</p> <p>17 Yes, they are. They talk about the</p> <p>18 difference between the most populous and least</p> <p>19 populous. So the term here is that they should not</p> <p>20 have population deviations greater than one person.</p> <p>21 Q. Okay. And so I pulled this up as</p> <p>22 Exhibit 4 again. Can you see that on the screen?</p> <p>23 A. I can.</p> <p>24 Q. And Congressional districts, I think</p> <p>25 it's under I: Requirements Of Federal Law, A.,</p>

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<p>1 Population equality. 2, Congressional districts.</p> <p>2 Is that what you were reading from?</p> <p>3 A. Correct. I just read the last sentence</p> <p>4 of that paragraph.</p> <p>5 Q. So the Senate was saying it did not want</p> <p>6 to assume the burden of justifying a larger</p> <p>7 deviation. Is that right?</p> <p>8 A. I would just stick to the precise</p> <p>9 language to avoid paraphrase. They say: So that</p> <p>10 the state may avoid assuming this burden, dot, dot,</p> <p>11 dot, a congressional redistricting plan should not</p> <p>12 have population deviations greater than one person.</p> <p>13 Q. And the NAACP plan, the Harpoonian plan</p> <p>14 and the League of Women Voters plan all had</p> <p>15 deviations greater than one person. Correct?</p> <p>16 A. That's correct.</p> <p>17 Q. Let's move to 4.3, Compactness.</p> <p>18 A. Yes.</p> <p>19 Q. And you use the three measures of</p> <p>20 compactness here: Polsby-Popper, Reock and Block</p> <p>21 Cut Edges. Is that right?</p> <p>22 A. That's right. But to be precise, I</p> <p>23 averaged the Polsby-Popper and the Reock scores over</p> <p>24 the plan.</p> <p>25 Q. Okay. And so my next question was going</p>	<p>1 Q. Anything.</p> <p>2 A. No. No, not to my knowledge.</p> <p>3 Q. And is a map drawer obligated to use any</p> <p>4 mathematical measures of compactness?</p> <p>5 A. Well, there have been instances where a</p> <p>6 court order specifies measures, in fact. That was</p> <p>7 the case in Pennsylvania litigation in 2018 that I</p> <p>8 was involved in. So in that instance I think you</p> <p>9 would be obligated to use particular metrics to</p> <p>10 comply with the court order. But absent some</p> <p>11 directive of that kind, it's a matter of discretion.</p> <p>12 Q. Was the General Assembly in South</p> <p>13 Carolina under a directive of that kind when it drew</p> <p>14 the enacted plan?</p> <p>15 A. Not to my knowledge.</p> <p>16 Q. I want to scroll back to page 8. Isn't</p> <p>17 it true that the House Guidelines eschewed, for lack</p> <p>18 of a better term, the use of mathematical</p> <p>19 calculations or determination for compactness?</p> <p>20 A. That's right. They say, and I quoted it</p> <p>21 here, that compactness should not be judged based</p> <p>22 upon any mathematical, statistical or formula-based</p> <p>23 calculation or determination.</p> <p>24 Q. And I believe in the footnote you also</p> <p>25 quote the Senate Guidelines.</p>
<p style="text-align: center;">Page 59</p> <p>1 to be if I pronounced Reock correctly. And it</p> <p>2 sounds like I'm in the ballpark, so thank you.</p> <p>3 A. To my knowledge, yes.</p> <p>4 Q. Thank you. How did you choose these</p> <p>5 three metrics?</p> <p>6 A. The Polsby-Popper and the Reock scores</p> <p>7 belong to a class of compactness scores that I call</p> <p>8 contour-based. And as I described it earlier in</p> <p>9 this report they are used -- let's see. I can</p> <p>10 actually quote it from page 8. "An advantage of the</p> <p>11 contour scores" -- and here I mean Reock and</p> <p>12 Polsby-Popper -- "is that they are familiar and in</p> <p>13 wide use." That's why I used those. I also include</p> <p>14 the more recently popular Block cut edges score</p> <p>15 because, as I say here, an advantage of discrete</p> <p>16 scores is that they do not excessively penalize</p> <p>17 districts for having winding boundaries when those</p> <p>18 boundaries come from physical geography like</p> <p>19 coastlines or rivers.</p> <p>20 Q. Thank you. I'm going to scroll back</p> <p>21 now -- thank you. I'm going to scroll back down to</p> <p>22 4.3. In your opinion, was the General Assembly</p> <p>23 obligated to use these metrics to measure</p> <p>24 compactness in the enacted plan?</p> <p>25 A. Obligated by what?</p>	<p style="text-align: center;">Page 61</p> <p>1 A. Right.</p> <p>2 Q. And I believe your phrase is that they</p> <p>3 shy away from shape consideration entirely,</p> <p>4 referencing what is sometimes called functional</p> <p>5 compactness. Is that right?</p> <p>6 A. That is right.</p> <p>7 Q. So in your review of these plans, on</p> <p>8 page 11 did you conduct any analysis of compactness</p> <p>9 other than use of these three metrics?</p> <p>10 A. There is other discussion of compactness</p> <p>11 in my report, namely in the qualitative descriptions</p> <p>12 in section 5. I frequently reference erratic</p> <p>13 shapes, a hook and so on. Those are compactness</p> <p>14 considerations that are more holistic in the manner</p> <p>15 that I think is actually preferred by the</p> <p>16 Guidelines. So both quantity and qualitative</p> <p>17 compactness are discussed in my report.</p> <p>18 Q. And we will certainly get to section 5</p> <p>19 in a preview of coming attractions, but here, in</p> <p>20 section 4.3, the only compactness analysis you have</p> <p>21 done here is the mathematical measures. Is that</p> <p>22 right?</p> <p>23 A. That's correct. This section is</p> <p>24 entitled: Review of metrics.</p> <p>25 Q. Thank you. Let's move down to 4.4,</p>

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<p style="text-align: right;">Page 62</p> <p>1 Political subdivisions.</p> <p>2 Actually, let me ask you one quick</p> <p>3 question back on compactness, if I might. So even</p> <p>4 under these metrics the enacted plan, it looks like,</p> <p>5 performs better than SC-NAACP1 on all three of these</p> <p>6 metrics. Is that right?</p> <p>7 A. That's right.</p> <p>8 Q. And it performs better than the</p> <p>9 Harpoonian plan on a Reock. Is that right?</p> <p>10 A. That's right. It performs worse on</p> <p>11 Polsby-Popper, substantially worse on block cut</p> <p>12 edges and better on Reock. Correct.</p> <p>13 Q. Thank you. And that's because each of</p> <p>14 these metrics measures a different thing. Is that</p> <p>15 right?</p> <p>16 A. Yes. And that's what those</p> <p>17 illustrations -- those gorgeous illustrations on</p> <p>18 your screen are attempting to illustrate.</p> <p>19 Q. Thank you. All right. Let's move to</p> <p>20 4.4, Political subdivisions.</p> <p>21 A. Yes.</p> <p>22 Q. And this, again, is just based on</p> <p>23 metrics. You didn't include in this section any</p> <p>24 analysis of other communities of interest. Is that</p> <p>25 right?</p>	<p style="text-align: right;">Page 64</p> <p>1 Q. And if I understand correctly, the</p> <p>2 number listed on the left of the slash is total</p> <p>3 splits, and the number on the right is splits</p> <p>4 affecting population. Is that right?</p> <p>5 A. That's exactly right.</p> <p>6 Q. And in your experience as a map drawer,</p> <p>7 why might a map drawer split something that does not</p> <p>8 affect population?</p> <p>9 A. One of the learning experiences for me,</p> <p>10 when I started drawing maps, was just how wild</p> <p>11 municipal boundaries can be. So what frequently</p> <p>12 happens, more in some parts of the country than</p> <p>13 others, that municipalities, as they are officially</p> <p>14 defined, may have spurs with no population.</p> <p>15 Sometimes just almost an individual line that runs</p> <p>16 out of the city and into -- for historical reasons</p> <p>17 and may run for many miles. So sometimes splits to</p> <p>18 municipalities divide these zero population spurs.</p> <p>19 And in this report I'm not offering an opinion on</p> <p>20 whether that's important or not. I'm reporting it</p> <p>21 both ways so that readers of the report can draw</p> <p>22 their own conclusions.</p> <p>23 Q. And on city splits here, we will just</p> <p>24 take column one, it looks like the enacted plan</p> <p>25 performs better than SC-NAACP1 Muscatel, Harrison</p>
<p style="text-align: right;">Page 63</p> <p>1 A. That's right. The divisions that are</p> <p>2 discussed here are counties, county subdivisions,</p> <p>3 cities and towns.</p> <p>4 Q. I'm going to scroll back to page 8.</p> <p>5 Now, is it true that the House Guidelines said that</p> <p>6 counties, municipalities or other political</p> <p>7 subdivisions would be given no greater weight as a</p> <p>8 matter of state policy than other identifiable</p> <p>9 communities of interest?</p> <p>10 A. Yes. That's a direct quote.</p> <p>11 Q. It's right there on page 8. Correct?</p> <p>12 And if we come back here to 4.4, Political</p> <p>13 subdivisions, I believe this is Table 4?</p> <p>14 A. Yes.</p> <p>15 Q. It appears the enacted plan performs</p> <p>16 better than both SC-NAACP plans on county splits,</p> <p>17 County pieces of subdivision splits and subdivision</p> <p>18 pieces. Is that right?</p> <p>19 A. That's right. Although I would say,</p> <p>20 particularly on subdivision splits, it's virtually</p> <p>21 the same as the second NAACP, 29 versus 30.</p> <p>22 Q. And then you also looked at city splits.</p> <p>23 Is that right?</p> <p>24 A. That's right. Cities and towns are in</p> <p>25 Table 5.</p>	<p style="text-align: right;">Page 65</p> <p>1 Sukovich and Roberts. Is that right?</p> <p>2 A. Yes. And worse than SC-NAACP2</p> <p>3 Harpoonian and the League.</p> <p>4 Q. One more question about splits that</p> <p>5 don't affect population.</p> <p>6 A. Yes.</p> <p>7 Q. In your experience, or to your knowledge</p> <p>8 are there census blocks that do not contain any</p> <p>9 population?</p> <p>10 A. In the 2010 census, 40 percent of the</p> <p>11 census blocks in the country had no population.</p> <p>12 Q. And how about in the 2020 census, do you</p> <p>13 know one way or the other?</p> <p>14 A. I actually don't know that number. I do</p> <p>15 know that one of the efforts the Census Bureau made</p> <p>16 in 2020 was to reduce the number of census blocks</p> <p>17 nationally. So I suspect that the number 40 percent</p> <p>18 has dropped. Irrespective of that, it is</p> <p>19 unquestionably the case that many blocks have no</p> <p>20 population.</p> <p>21 Q. And does a map drawer have to put those</p> <p>22 blocks in a district somewhere?</p> <p>23 A. That's an interesting question. It</p> <p>24 really depends.</p> <p>25 One thing that stood out to me, in some</p>

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<p style="text-align: right;">Page 66</p> <p>1 of the litigation that I have been involved in, is 2 that sometimes maps that are presented differ in how 3 they handle which blocks have to be assigned. So I 4 would say that there is not complete consensus on 5 the question of which blocks have to be assigned but 6 that, in my view, it's best practice to assign all 7 of the blocks in the state.</p> <p>8 Q. And can assigning census blocks without 9 population help make a district to be contiguous of 10 a particular shape or something like that?</p> <p>11 A. Definitely.</p> <p>12 Q. Section 4.5 addresses Incumbency. And 13 you have listed here incumbent pairings in various 14 plans. Is that right?</p> <p>15 A. I have.</p> <p>16 Q. Where did you get the incumbent 17 residency information from?</p> <p>18 A. This is from the shapefile that I 19 mentioned with electoral data that was provided by 20 counsel.</p> <p>21 Q. And so it was preloaded in that file? 22 You didn't get it from somewhere else or merge two 23 files together or anything like that?</p> <p>24 A. So shapefiles -- even though we say a 25 shapefile, a shapefile is actually a collection of</p>	<p style="text-align: right;">Page 68</p> <p>1 statistics on VTD splits. I certainly could if that 2 would be helpful.</p> <p>3 Q. And did you give any statistics on 4 partisan performance?</p> <p>5 A. Not in this section because, indeed, 6 partisan performance is not listed among the 7 criteria in the Guidelines. But I certainly do 8 discuss partisan performance later in my report.</p> <p>9 Q. You said that you focused on the 10 criteria that had, quote -- "high billing" I think 11 was your phrase. Is that a phrase you used a moment 12 ago?</p> <p>13 A. I believe you.</p> <p>14 Q. If I'm wrong you can correct me on the 15 transcript. But how did you determine which 16 criteria do or do not have high billing or otherwise 17 merited inclusion here in section 4?</p> <p>18 A. I'm referring, sort of generally, to 19 things like being the heading of a section or being 20 in boldface, things like that. So that, for 21 example, if you review the House Guidelines you will 22 see that core retention is nowhere a section header 23 or in boldface. That is an informal 24 characterization of the billing in the Guidelines.</p> <p>25 Q. And was the General Assembly prevented</p>
<p style="text-align: right;">Page 67</p> <p>1 files. And so it's a little bit insubstantial to 2 talk about whether things were in separate files or 3 the same one, but it was all in the same data 4 package. It was all in the same delivery.</p> <p>5 Q. And before I go to section 5 I want to 6 go back and just round out a few questions on this 7 section 4.</p> <p>8 A. Yes.</p> <p>9 Q. Did you omit from section 4 any 10 traditional criteria contained in the General 11 Assembly's Guidelines?</p> <p>12 A. I made an effort to address all the ones 13 that had high billing. There isn't a numerical 14 discussion of core retention. But again, as we 15 reviewed when we looked at the Guidelines before, 16 core retention is kind of packaged with other 17 considerations in the Guidelines, and it wasn't a 18 clear heading, in particular, in the House 19 Guidelines. So I do not give core retention 20 statistics across the plans but I do give core 21 retention statistics in places where I think they 22 are relevant in the report.</p> <p>23 Q. And what about VTD splits, did you give 24 statistics on VTD splits here?</p> <p>25 A. It does not look like I did give</p>	<p style="text-align: right;">Page 69</p> <p>1 from considering factors that were not in bold 2 headings in the Guidelines?</p> <p>3 A. I know of no attempt to restrain them 4 from other considerations.</p> <p>5 Q. So could the General Assembly consider 6 criteria that were not in bold headings in the 7 Guidelines?</p> <p>8 A. Well, my view of my reading here is that 9 they can consider anything that they want, but not 10 at the expense of the criteria that I listed here.</p> <p>11 Q. Where, in the Guidelines, does it say 12 that they can't consider core preservation at the 13 expense of these other criteria?</p> <p>14 A. Well, let's see. Well, in particular, 15 it says that all criteria -- I'm here reading from 16 the House Guidelines, from the last page in Priority 17 of Criteria. It says: If there is a conflict among 18 the requirements of these guidelines, the 19 requirements addressed in the first section should 20 be given priority.</p> <p>21 Let's see if I can find anything that 22 refers to considerations outside the Guidelines. 23 I'm not sure if that's addressed, but I will try to 24 find out. I suppose that it is implicit in 25 statements such as Incumbency consideration, which</p>

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<p>1 is listed here; therefore, it's a named principle. 2 It shall not influence the redistricting plan to 3 such an extent as to overtake other redistricting 4 principles.</p> <p>5 So though it's not made explicit, I 6 would say that a reasonable reader would conclude, 7 quite strongly, even, that unnamed criteria also 8 cannot overtake the redistricting principles that 9 are here named. But I concede to you that that is 10 just an attempt to make sense of what's written here 11 and not explicit text.</p> <p>12 Q. And are you looking currently at the 13 House Guidelines?</p> <p>14 A. I was just reading from the House 15 Guidelines. Correct.</p> <p>16 Q. And can you see those on the screen now?</p> <p>17 A. Yes.</p> <p>18 Q. It takes me a moment to catch up with 19 you, so I appreciate your patience. And the House 20 Guidelines here, in part VII, mention Communities of 21 Interest?</p> <p>22 A. Uh-huh.</p> <p>23 Q. Are you aware of any authority or any 24 decisions treating existing districts and cores of 25 districts as a community of interest?</p>	<p style="text-align: center;">Page 70</p> <p>1 My follow-up question is, is preserving 2 cores of districts necessarily about incumbency? 3 A. I think that it substantially overlaps 4 incumbency consideration. There may be 5 circumstances where it's decoupled from incumbency, 6 such as the retirement of a representative, but as a 7 general matter it's very hard to disambiguate core 8 preservation from favoring other incumbents.</p> <p>9 Q. And you're saying that as a general 10 matter, not necessarily as a South Carolina matter. 11 Is that right?</p> <p>12 A. That's correct.</p> <p>13 Q. Are you aware of any requirements or 14 restrictions in South Carolina on treating cores of 15 districts as a community of interest?</p> <p>16 A. Just to make sure, let me clarify the 17 question. You're asking if I know of any rules or 18 guidelines that touch on that?</p> <p>19 Q. I'm asking, I think, a slightly 20 different question. I think you said, generally, 21 that there are states that prohibit consideration of 22 incumbency -- or favoring of incumbents in drawing 23 districts. Right?</p> <p>24 A. That's right.</p> <p>25 Q. Maybe Florida is one of those, or some</p>
<p>1 A. Can you ask that again, please?</p> <p>2 Q. Certainly. Let me ask it a little bit 3 more simply. Can a core of a district or an 4 existing district be considered a community of 5 interest?</p> <p>6 A. In the eyes of a court?</p> <p>7 Q. Let's start generally. As a general 8 matter can it be a community of interest?</p> <p>9 A. In my view, that would be a 10 controversial use of the phrase "community of 11 interest."</p> <p>12 Q. And why would that be a controversial 13 use of the phrase?</p> <p>14 A. Because it overlaps awkwardly with 15 incumbency consideration. So first of all, you're 16 asking me generally, I believe, and not as pertains 17 to South Carolina specifically. So generally --</p> <p>18 Q. At the moment that's right. Yeah.</p> <p>19 A. Right. So generally, I would say quite 20 a few states prohibit incumbency consideration. And 21 so it certainly would be controversial there to 22 smuggle that back in under the guise of communities 23 of interest. Does that make sense?</p> <p>24 Q. I understand that. I think it's a 25 general matter.</p>	<p style="text-align: center;">Page 71</p> <p>1 other states. Correct?</p> <p>2 A. Quite a few, yeah.</p> <p>3 Q. And you said, as a result, that then 4 affects the extent to which or whether map drawers 5 can consider preservation of cores of districts in 6 those states. Is that right?</p> <p>7 A. That's right.</p> <p>8 Q. So I'm just asking, is there anything 9 that you're aware of in South Carolina law that 10 functions that way and would prohibit consideration 11 of preservation of cores?</p> <p>12 A. Right. I understand. No, there is 13 nothing in the law that I'm aware of.</p> <p>14 Q. And are you aware of anything in the law 15 that would prohibit the General Assembly from 16 treating cores of districts as communities of 17 interest in South Carolina?</p> <p>18 A. Nothing in the law that I'm aware of.</p> <p>19 Q. Are you aware of anything else that 20 would prohibit them from doing so?</p> <p>21 A. I would say that as a matter of good 22 government best practices, that there would be some 23 significant skepticism of using the communities of 24 interest heading in that way.</p> <p>25 Q. And which good government best practices</p>

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<p style="text-align: right;">Page 74</p> <p>1 are you referring to? 2 A. Well, traditional districting principles 3 are thought to provide a framework that helps 4 redistricting achieve fairer and more objectively 5 measurable outcomes. And as such I have been at 6 quite a few presentations by nonpartisan groups such 7 as NCSL, the National Conference of State 8 Legislatures, in which best practices around the 9 principles is discussed. And I have never heard a 10 discussion in which district cores and incumbency 11 are considered to be legitimate communities of 12 interest from outside groups. That's not to say 13 that there is any law on the subject. I have 14 written about the law of communities of interest, 15 and it is complicated and far from a unified body of 16 decisions. So I'm not claiming there is any clear 17 statements in law.</p> <p>18 And again, I'm not a lawyer. So to your 19 question, I think the phrase "good government 20 principles" refers, generally, to the community of 21 people trying to clarify the role of various 22 redistricting principles and not to stipulations of 23 law.</p> <p>24 Q. Thank you for all that. 25 Did you rely on those good government</p>	<p style="text-align: right;">Page 76</p> <p>1 summary, section 3B is called: Constituent 2 consistency. And it employs the phrase: 3 "Preserving the cores of existing districts." 4 Q. I'm going to share that again for the 5 record. I believe you're reading here off of page 6 2, this heading B, Constituent consistency. Is that 7 correct?</p> <p>8 A. That's right.</p> <p>9 Q. And how that heading also discusses 10 keeping incumbents' residences in their districts 11 with their core constituents and avoiding contests 12 between incumbent legislators. Did I read that 13 correctly?</p> <p>14 A. Yes. It says that all three of those 15 should be considered.</p> <p>16 Q. And I'm going to pull up your report 17 again if I can figure out how. And here, in section 18 4, you discussed incumbent pairing but not 19 preserving cores of districts. Is that right?</p> <p>20 A. That's right. In this section I 21 discussed incumbent pairing but not core 22 preservation.</p> <p>23 Q. All right. I would like to move on now 24 to your detailed district review in section 5, if 25 that's okay.</p>
<p style="text-align: right;">Page 75</p> <p>1 principles or best practices in formulating your 2 report? 3 A. I don't see that those are anywhere 4 referenced in my report.</p> <p>5 Q. Okay. Now, you say that the law is 6 complicated and far from unified in communities of 7 interest. Is that right?</p> <p>8 A. That is right.</p> <p>9 Q. Can you give me an example of what you 10 mean by that?</p> <p>11 A. Sure. For instance, the extent to which 12 the partisan beliefs of a group constitute a 13 legitimate community of interest I think is an 14 example where the law of the case law is unclear or 15 conflicted. If you want specifics, we could refer 16 to various pieces of writing that have been 17 published. So I'm speaking now in generality and 18 from memory.</p> <p>19 Q. Thank you. And I appreciate the caveat. 20 Not a trick question. Thank you.</p> <p>21 A. I'm just trying to be careful and 22 complete in my answers.</p> <p>23 Q. And do the Senate Guidelines expressly 24 note preserving cores of districts as a criteria?</p> <p>25 A. Let's find out. As I mentioned in my</p>	<p style="text-align: right;">Page 77</p> <p>1 A. Yes. 2 Q. Will you briefly describe to me the 3 methodology you're using here in section 5? 4 A. Sure. So I begin by recalling the BVAP 5 by district in the four districts numbered 1, 2, 5 6 and 6, as well as the Polsby-Popper score, which is 7 the most widely used compactness score in 8 litigation. Then I show, in Figure 3, the terrain 9 that has moved in and out of District 6 in the 10 transition from benchmark map to the enacted map. 11 And then in sections 5.1, 2, and 3 I examine, 12 serially, Districts 1, 2 and 5 and highlight 13 qualitative, as opposed to quantitative, features of 14 the districts that seem, to me, to bear on the 15 principles.</p> <p>16 Q. Have you offered this kind of 17 qualitative analysis in any prior cases in which you 18 have been an expert?</p> <p>19 A. Yes. Routinely.</p> <p>20 Q. Let's go to page 15 maybe. This is 21 Figure 3. And I believe you said this shows terrain 22 moved in and out of CD 6.</p> <p>23 A. Yes.</p> <p>24 Q. And you said the reassignment is 25 happening in scattered chunks and shards. Can you</p>

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<p>1 tell me what you mean by that?</p> <p>2 A. Sure. The colored areas, which are the</p> <p>3 areas that were reassigned, are not one connected</p> <p>4 component or two connected components, but it looks</p> <p>5 like maybe up to ten if -- I'm informally trying to</p> <p>6 count. Some of them are large and some are so small</p> <p>7 that you have to zoom in quite far to see them. So</p> <p>8 that's what merits the colorful phrase "scattered</p> <p>9 chunks and shards."</p> <p>10 Q. And when you talk about areas being</p> <p>11 large or small are you talking about geography or</p> <p>12 population?</p> <p>13 A. Both.</p> <p>14 Q. And these changes involved more than two</p> <p>15 districts. Is that right?</p> <p>16 A. Correct. What you see here is 6 to 2, 6</p> <p>17 to 1. And what does it say here, and into 6 from</p> <p>18 the neighbors.</p> <p>19 Q. And can you show here that any areas</p> <p>20 moved in or out of -- in between 6 and 5?</p> <p>21 A. Unclear. That may be covered in -- let</p> <p>22 me think about that for a moment. Yeah. That's</p> <p>23 unclear because there is purple both on the south</p> <p>24 side of the map. And if you zoom in you can also</p> <p>25 see purple near Columbia. And so I'm not entirely</p>	<p>1 A. I read all of the public testimony and</p> <p>2 made a good-faith effort to summarize and synthesize</p> <p>3 it.</p> <p>4 Q. So it's fair to say you read the public</p> <p>5 hearing transcripts and then drew conclusions based</p> <p>6 on that reading. Is that right?</p> <p>7 A. That's right.</p> <p>8 Q. And have you ever used that method</p> <p>9 before in any of your prior expert reports?</p> <p>10 A. Let's see. I'm trying to think those</p> <p>11 through. I certainly have used selections from</p> <p>12 public hearing testimony before, but I will say that</p> <p>13 in many of my prior expert reports the state</p> <p>14 collected not only oral testimony, narrative</p> <p>15 testimony, but also collected maps. And when the</p> <p>16 state collects maps it's possible to synthesize</p> <p>17 those as a matter of data science. When the state</p> <p>18 collects only narratives, it is much more difficult</p> <p>19 to synthesize precisely.</p> <p>20 Q. So in any of your prior expert reports</p> <p>21 have you done what you did here, which was to read</p> <p>22 all the public hearing testimony and then identify</p> <p>23 certain communities within that testimony?</p> <p>24 A. Yes, and particular in Wisconsin.</p> <p>25 Q. And so --</p>
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<p>1 sure whether that -- some of that may well be</p> <p>2 involving District 5. It's not identified in</p> <p>3 this -- in this plot.</p> <p>4 Q. All right. And you also say that the</p> <p>5 reassignment is not aimed at healing key splits of</p> <p>6 cities and communities that were frequently cited in</p> <p>7 the public testimony, including Columbia, Sumter</p> <p>8 Orangeburg and Charleston. Is that right?</p> <p>9 A. Yes, that is an accurate quote.</p> <p>10 Q. Do either the House or the Senate</p> <p>11 Guidelines say anything about these particular</p> <p>12 communities and whether they should be split or</p> <p>13 reunified?</p> <p>14 A. These communities are not named in the</p> <p>15 Guidelines.</p> <p>16 Q. Were any of these communities split in</p> <p>17 the benchmark plan from 2010?</p> <p>18 A. I think it's implied here, by the word</p> <p>19 "healing," that they were split. And when I say</p> <p>20 that they are not aimed at healing, I mean those</p> <p>21 splits were not addressed or lessened in the move</p> <p>22 from the benchmark to the enacted plan.</p> <p>23 Q. How did you identify these four</p> <p>24 communities of interest for this portion of your</p> <p>25 report?</p>	<p>1 A. Sorry. Excuse me. It's also addressing</p> <p>2 the South Carolina State House districts also in</p> <p>3 that report.</p> <p>4 Q. Got it. And do you have -- is there any</p> <p>5 support or discussion of this particular method in</p> <p>6 any academic literature that you're aware of?</p> <p>7 A. That is, is there any discussion of the</p> <p>8 method of using public testimony to identify</p> <p>9 communities of interest?</p> <p>10 Q. To identify a subset of communities of</p> <p>11 interest.</p> <p>12 A. I'm sorry. Could you rephrase?</p> <p>13 Q. Sure. Let me ask you this: Were these</p> <p>14 the only four communities of interest identified in</p> <p>15 the public testimony?</p> <p>16 A. I see. No, certainly not. Thank you</p> <p>17 for rephrasing.</p> <p>18 Q. Yeah. Sorry.</p> <p>19 Okay. So I want to understand how you</p> <p>20 identified these four out of the various communities</p> <p>21 of interest that were identified in the public</p> <p>22 hearing testimony. So can you tell me why you</p> <p>23 identified these four, as opposed to other</p> <p>24 communities of interest?</p> <p>25 A. Sure. And incidentally, if you look at</p>

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<p style="text-align: right;">Page 82</p> <p>1 Figure 13 in my report, which is on page 30, you 2 will see one, two, three, four -- five areas 3 highlighted, which I call "A selection of COIs 4 identified in public testimony." So this is page 5 30.</p> <p>6 Q. Right. I think I'm there. I'm sorry. 7 These are different than what you have got in the 8 form we were just talking about. Correct?</p> <p>9 A. To be clear, this is labeled "A 10 selection." But yeah, let me try to restate and 11 clarify the broader point that I'm making.</p> <p>12 The testimony in South Carolina, which I 13 made a significant effort to contend with in its 14 entirety, was exclusively narrative. And that makes 15 it quite challenging to do what a data scientist 16 would call operationalizing the testimony into 17 chunks that you might consider individual COIs. 18 However, I have made a good-faith effort to do that 19 by looking for themes in the public testimony and 20 trying to do so in an even-handed way.</p> <p>21 Q. How did you determine which communities 22 of interest discussed in the public hearing 23 testimony to include in your report?</p> <p>24 A. I attempted to find the ones most 25 frequently discussed and most explicitly delineated.</p>	<p style="text-align: right;">Page 84</p> <p>1 quantification or quantitative analysis in 2 communities of interest. Is that right? 3 A. I think maybe a good way to answer your 4 question would be to say what academic domain this 5 falls in. So this falls in an area that has a huge 6 literature called "participatory mapping" that's 7 part of the academic geography literature. I would 8 say there are hundreds of papers on participatory 9 mapping and the idea of taking seriously public 10 input, grass-roots input. So I don't know that any 11 of those papers focuses specifically on applications 12 to redistricting, but there is really no shortage of 13 both qualitative and quantitative support for the idea 14 of community mapping.</p> <p>15 Q. And here I'm just looking for a simple 16 yes or no answer to this next question.</p> <p>17 A. Sure.</p> <p>18 Q. Is there any academic literature that 19 discusses the method you used here, in this report, 20 this specific method?</p> <p>21 A. I'm trying to give you the yes or no 22 answer. I would say the detailed method used here, 23 no.</p> <p>24 Q. Okay. Thank you. And how about are you 25 aware of any court decisions or opinions discussing</p>
<p style="text-align: right;">Page 83</p> <p>1 It is a good-faith effort to do just that.</p> <p>2 Q. And as part of that good-faith effort 3 did you count the number of comments or the number 4 of commenters? I'm just trying to understand how 5 you determined what was getting more or less 6 emphasis than something else.</p> <p>7 A. To be clear, I would have greatly 8 preferred a more data-intensive record. But from 9 the narrative record I made a complete but 10 qualitative review.</p> <p>11 Q. And are you aware of any academic 12 literature that discusses, supports or endorses the 13 kind of qualitative review you undertook here?</p> <p>14 A. Well, I have a book chapter that 15 discusses the use of public testimony. I have a 16 paper under review that discusses the quantification 17 methods you can use when that testimony is 18 accompanied with maps. I'm trying to think of other 19 examples.</p> <p>20 Generally, I would say there is a 21 shortage of peer-reviewed work on communities of 22 interest, generally; something I hope to address in 23 the coming months and years.</p> <p>24 Q. And to the extent that that literature 25 exists, I think I heard you say that it was a</p>	<p style="text-align: right;">Page 85</p> <p>1 the detailed method that you employed here in this 2 report?</p> <p>3 A. All right. I do think -- and please 4 tell me if this is responsive to your question 5 because I'm sincerely trying to be, I do think there 6 are cases where courts have taken, quite seriously, 7 informal communities of interest, as reflected in 8 the public record. For instance, in Texas.</p> <p>9 Q. And I'm looking for just a yes or no 10 answer to the next question.</p> <p>11 A. Sure.</p> <p>12 Q. Are you aware, one way or the other, 13 whether any court has discussed the specific method 14 you used in this report?</p> <p>15 A. While I would love to give you a simple 16 yes or no, I think too much hinges on what's meant 17 by "the specific method." I'm sorry. But I would 18 say that I'm trying to follow what I take to be the 19 way courts have used communities of interest. I am 20 trying to follow that here to the best of my ability 21 with the public record available.</p> <p>22 Q. Is public testimony in a redistricting 23 record statistically random?</p> <p>24 A. I don't understand the question.</p> <p>25 Q. Is public testimony -- who can provide</p>

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<p style="text-align: right;">Page 86</p> <p>1 public testimony?</p> <p>2 A. Okay. In many states anyone can. For 3 instance, the cycle in Michigan, the commission 4 debated whether only residents could provide 5 testimony and decided that it would be open to 6 anyone.</p> <p>7 Q. And among the people who show up to 8 testify, for example, are they a statistically 9 random sample of the statewide population?</p> <p>10 A. I'm not sure I understand what that 11 would mean, but I think the spirit is are they -- 12 are there any statistics gathered on commenters. Am 13 I understanding right?</p> <p>14 Q. Well, what I really want to understand 15 is, are commenters, whoever shows up to comment in a 16 public -- in public hearing, can we extrapolate from 17 that that their views represent the views of the 18 entire state or the populous at large from which 19 they are drawn?</p> <p>20 A. Well, certainly not. With any public 21 anticipatory effort there is always going to be a 22 kind of small sample. And it's hard to say exactly 23 what that might represent in terms of the overall 24 views of all residents, all adults, all voters or 25 some other universe.</p>	<p style="text-align: right;">Page 88</p> <p>1 resources not to take it seriously as the best 2 record we have of residents characterizing their own 3 communities.</p> <p>4 Q. And regardless of whether it is the best 5 we have or is something that the General Assembly 6 should have, could have or did, in fact, take 7 account of, I'm asking a slightly different 8 question, which is, do the points of emphasis -- can 9 you say, one way or the other, whether the points of 10 emphasis in the public testimony accurately 11 represent the views of the points of emphasis of the 12 populous generally in South Carolina?</p> <p>13 A. I think it's reasonable to assume a 14 correlation. Is that what you mean? It's not going 15 to be the entirety, necessarily, but I think it's 16 reasonable to assume correlation.</p> <p>17 Q. And have you conducted any analysis, 18 either survey analysis or anything like that to try 19 to capture the views of individuals who did not 20 provide public hearing testimony with respect to 21 communities of interest?</p> <p>22 A. In South Carolina, certainly not.</p> <p>23 Q. And did plaintiff's counsel ever 24 instruct you to focus, back on page 15, on these 25 four communities, Columbia, Sumter, Orangeburg and</p>
<p style="text-align: right;">Page 87</p> <p>1 Q. So if I can just briefly summarize, the 2 public testimony does not necessarily represent the 3 views of all voters or all residents of the state. 4 Is that correct?</p> <p>5 A. It certainly does not represent the 6 views of all voters. It could not.</p> <p>7 Q. And I think you said that you were 8 looking for communities of interest that got 9 particular focus or emphasis in the public hearing 10 testimony. Is that right?</p> <p>11 A. That's right. I looked for themes, is 12 the phrase that I used.</p> <p>13 Q. And so would those communities of 14 interest necessarily be a point of focus or emphasis 15 for all voters or all individuals in the state?</p> <p>16 A. Again, I clearly concede that there is 17 no way testimony could possibly capture everything. 18 That's certain.</p> <p>19 Q. But would the weight of that testimony 20 be representative of the weight of the views among 21 all residents or all voters in the state?</p> <p>22 A. Well, I believe that it's the best we 23 have, that, in fact, considerable effort was 24 expended by the State to collect it. And it strikes 25 me that it would be misuse of that time and those</p>	<p style="text-align: right;">Page 89</p> <p>1 Charleston?</p> <p>2 A. No. These were my own choices.</p> <p>3 Q. And I think you have already testified 4 that there were other communities of interest 5 identified in the public hearing testimony. Is that 6 right?</p> <p>7 A. Yes. I would estimate that the public 8 testimony probably runs to over 1,000 pages. So it 9 certainly discusses many other areas.</p> <p>10 Q. That sounds low to me, even, 1,000 11 pages.</p> <p>12 A. I'm trying to be conservative with my 13 numbers.</p> <p>14 Q. That makes sense. Okay. 15 So let's move on to 5.1, District One. 16 And you again -- is this a choropleth. Am I saying 17 that right, choropleth here, Figure 4?</p> <p>18 A. It is, highlighting District 1.</p> <p>19 Q. All right. So you mention here, under A 20 is the Jasper County split. And you note that two 21 Jasper County precincts are included in the new 22 District 1. Is that right?</p> <p>23 A. That's right.</p> <p>24 Q. Are you aware of any public testimony 25 that supported splitting these two precincts from</p>

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<p style="text-align: right;">Page 90</p> <p>1 the rest of Jasper County? 2 A. Off the top of my head, no. If I go to 3 selections from public testimony, I see that I have 4 included, on page 31, one selection, which is Mary 5 Ann Bromley who says: "The economic importance of 6 the Jasper Port Project is an excellent example of a 7 shared community of interest for residents of both 8 counties in that area." So if anything, Bromley's 9 quote goes to the idea that this area should be kept 10 together.</p> <p>11 Q. And are you aware of any other testimony 12 in the public record or do you recall any today that 13 might actually support this split of Jasper County?</p> <p>14 A. No. It's entirely possible that there 15 is some.</p> <p>16 Q. And the next, under B you mention 17 Dorchester County.</p> <p>18 A. Yes.</p> <p>19 Q. And was Dorchester split in the 20 benchmark plan?</p> <p>21 A. Let's see. I don't mention that here 22 and so I don't have materials in front of me to make 23 that determination.</p> <p>24 Q. And are you aware of any public 25 testimony that supported splitting Dorchester</p>	<p style="text-align: right;">Page 92</p> <p>1 BY MR. GORE: 2 Q. Okay. So Dr. Duchin, do you recall any 3 testimony about -- 4 A. Sorry. I lost sound there. 5 Q. Can you hear me now? 6 A. I can, yes. 7 Q. Wonderful. Do you recall any testimony 8 in a public record identifying Beaufort County as a 9 community of interest?</p> <p>10 A. Yes. I have quite a few commenters, 11 cited on pages 31, 2, 3, 4, 5 and 6 that all mention 12 Beaufort.</p> <p>13 Q. And are you aware -- turning back now to 14 Dorchester County, are you aware of any other 15 justifications for the splits in Dorchester?</p> <p>16 A. Other than public testimony?</p> <p>17 Q. Yes. Let me ask it this way. It's, 18 again, not a trick question. Did you examine 19 whether there are any justifications for splitting 20 Dorchester County, say, in the legislative record?</p> <p>21 A. Okay. I can say that I did not examine 22 the legislative proceedings. I restricted my review 23 to the already voluminous public testimony on 24 community.</p> <p>25 Q. And then you mention the Coastal and</p>
<p style="text-align: right;">Page 91</p> <p>1 County? 2 A. I am not, off the top of my head. But 3 if I go back to the selections from public testimony 4 I can see that I quoted one person, Tim Lewis, who 5 identified the county as a community of interest. 6 Incidentally, let me mention, this 7 frequently occurred in the public testimony, in my 8 review, that people talked about their county as 9 their community of interest.</p> <p>10 Q. Were there any other examples that you 11 can think of?</p> <p>12 A. Not off the top of my head.</p> <p>13 Q. And do you recall whether there was any 14 such testimony with respect to Berkeley County?</p> <p>15 A. Let's see. I do have selections in the 16 supplement on pages 34, 35 and 36 that all mention 17 Berkeley County in various ways.</p> <p>18 Q. And how about what I believe South 19 Carolinians refer to as Beaufort, B-E-A-U-F-O-R-T? 20 And I see Leah nodding, so I hope I got 21 that in the ballpark.</p> <p>22 MS. ADEN: I'm not the one to give you 23 the green light.</p> <p>24 MR. MATHIAS: Soften the T a little more 25 and you will be there.</p>	<p style="text-align: right;">Page 93</p> <p>1 Lowcountry COIs disregarded. And I believe that's 2 your heading C here on page 16. Is that right?</p> <p>3 A. That is right.</p> <p>4 Q. And was Charleston split in the 5 benchmark plan?</p> <p>6 A. I believe that it was; although I don't, 7 again, have the benchmark plan in front of me.</p> <p>8 Q. That's fine. Are you aware of any 9 public testimony that supported splitting 10 Charleston -- or maintaining a split of Charleston 11 into two districts?</p> <p>12 A. I could not quote such testimony as I 13 sit here, but it is entirely possible that there was 14 testimony of that kind.</p> <p>15 Q. So Colleton County -- I think I know the 16 answer to this question. You mentioned Colleton. 17 But do you know, as you sit here right now, whether 18 Colleton County was split in the benchmark plan?</p> <p>19 A. There is testimony referring to 20 Colleton's split that's included here, so that gives 21 me reason to believe that it was split.</p> <p>22 Q. And are you aware of any public 23 testimony that supported splitting Colleton County 24 or maintaining a split in Colleton County?</p> <p>25 A. I am checking what is included here.</p>

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<p style="text-align: right;">Page 94</p> <p>1 From what I included, what I see is that the mayor 2 of Walterboro testified that Colleton is very 3 divided, but that it would be kept, quote, together 4 as much as possible as a community of interest. 5 That's not to say that other testimony might not 6 have -- you will find this quite frequently, that 7 you can have testimony preferring one thing and 8 testimony preferring an opposite thing. And I don't 9 deny that that is possible. Again, it's a huge 10 record and it's all narrative.</p> <p>11 Q. And how about Beaufort? Do you know 12 whether Beaufort was split in the benchmark plan?</p> <p>13 A. I don't have a benchmark plan in front 14 of me. I'm sorry.</p> <p>15 Q. Now, you mention here that the 16 Harpoottlian proposal is highly cognizant of the 17 COIs.</p> <p>18 A. I did.</p> <p>19 Q. What do you mean by that?</p> <p>20 A. Well, let's look at page 3 which shows 21 images of the districting plans. I find that, in 22 particular, in the Lowcountry area, Harpoottlian and 23 Coastal regions of the South that Harpoottlian has, I 24 think visually prioritized maintaining those 25 counties in that region together.</p>	<p style="text-align: right;">Page 96</p> <p>1 this timeline, but I have no reason to believe this 2 not to be true. And that in his introduction of the 3 plan, as an amendment, discussed the elements of -- 4 some of the elements of community that were in play.</p> <p>5 Q. And this timeline that you received from 6 counsel, was that in writing?</p> <p>7 A. No. And by "timeline" here I mean only 8 the informal sense that the NAACP plans had been 9 introduced before the public testimony was complete.</p> <p>10 That's my impression from informal conversations.</p> <p>11 But that is what I'm referring to as timeline, and 12 that some of the legislative debate had already been 13 ongoing at the time that the Harpoottlian amendment 14 was introduced. My impression, again, is that it 15 came late in the process.</p> <p>16 Q. A moment ago when you were discussing 17 the Harpoottlian plan, I believe you said it's 18 difficult for a plan to be superlative on all 19 metrics.</p> <p>20 A. I did.</p> <p>21 Q. Well, what did you mean by that?</p> <p>22 A. Well, I meant that as all of us in the 23 redistricting trenches know, that redistricting 24 involves tradeoffs between the metrics. If you 25 optimize on one, you might do so at cost to some</p>
<p style="text-align: right;">Page 95</p> <p>1 I, in my review of the metrics, found 2 that Harpoottlian seemed to take the public testimony 3 into account while still having an excellent showing 4 on most of the metrics, though it's very hard to be 5 superlative on all the metrics simultaneously.</p> <p>6 I'm sorry. I want to make sure I'm 7 answering your question. So you were asking 8 specifically why I thought Harpoottlian had taken the 9 public testimony into account?</p> <p>10 Q. I believe what it says on 16 is the 11 Harpoottlian proposal is highly cognizant of these 12 COIs. And I'm trying to understand the phrase 13 "highly cognizant," whether you're just saying they 14 are not splitting his plan or there is something 15 else that was done with respect to these communities 16 of interest in the Harpoottlian proposal that I may 17 have missed.</p> <p>18 A. Right. So I mentioned before that one 19 of the sets of facts that was related to me by 20 counsel had to do with the timeline of when maps 21 were introduced relative to public testimony, and so 22 it's my understanding that Harpoottlian is one of the 23 ones that was released after all of the public 24 testimony had been completed. This is my 25 understanding. I have not independently verified</p>	<p style="text-align: right;">Page 97</p> <p>1 others. So it's hard to simultaneously be the best 2 plan in contention on each of the twenty or so 3 different metrics in play. But given that, I find 4 Harpoottlian to really be very strong in its 5 balancing with the tradeoffs.</p> <p>6 Q. And is the Harpoottlian plan the only 7 plan that strikes a strong balance on the various 8 tradeoffs?</p> <p>9 A. Let me think about a reasonable response 10 to that. I can identify strengths and weaknesses in 11 a number of the plans. But through the process of 12 review Harpoottlian emerged, in my opinion, as a 13 particularly strong option that was available to the 14 legislature at the time of enactment.</p> <p>15 Q. And in your opinion and experience how 16 does a map drawer -- or how should a map drawer 17 determine where to strike the balance on these 18 various tradeoffs?</p> <p>19 A. Well, in my experience, a map drawer 20 usually is either under an assignment to produce a 21 demonstration of some principles or is trying to 22 qualitatively optimize in view of law and local 23 practice. So how should they strike the balance? I 24 couldn't answer that in generality.</p> <p>Q. And so some of that turns on additional</p>

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<p style="text-align: right;">Page 98</p> <p>1 assignments or instructions a map drawer might 2 receive. Is that right? 3 A. That's right. 4 Q. And what's an example of that, in your 5 experience or observation? 6 A. For instance, they might be instructed 7 to use a particular compactness metric. That's an 8 example. Or they might be instructed to split -- 9 they might -- you know, I will use North Carolina as 10 an example, where legislative plans are under a very 11 stringent whole-county provision that makes it clear 12 exactly how to treat the requirements around county 13 splits. It's more explicit in North Carolina than 14 in most of the country. So if you were drawing 15 there, you would need to be cognizant of that 16 framework. 17 Q. So let me just ask another hypothetical. 18 If a map drawer was told to place emphasis on 19 preserving communities of interest, for example, 20 might that affect the compactness score of the map 21 or result in a map that's less compact than if your 22 map drawer had been told to consider compactness 23 over communities of interest? 24 A. Certainly. 25 Q. And would the same be true of, say, with</p>	<p style="text-align: right;">Page 100</p> <p>1 articulated publicly. 2 Q. And with respect to those publicly 3 articulated principles, isn't it correct that 4 keeping these counties together would have involved 5 tradeoffs with other of the publicly available 6 principles? 7 A. I will say it could have, definitely. 8 Q. And I think you mentioned that the state 9 might have been prioritizing criteria that are 10 not -- were not in the public guidelines. Is that 11 right? 12 A. Definitely. 13 Q. And are you aware of any legal 14 prohibition on considering those criteria in South 15 Carolina? 16 A. No. I think we have discussed the full 17 extent of the legal framework that I am aware of. 18 So just to be clear, the example that I 19 just gave was partisanship. And I am not aware of 20 any law that prevents the legislature from 21 prioritizing partisan motives. 22 Q. And are you aware of anything in the law 23 that prevents the legislature from considering a 24 private criteria -- criterion over the publicly 25 available criteria?</p>
<p style="text-align: right;">Page 99</p> <p>1 preservation of cores and compactness? 2 A. Yes, I would say the same would be true 3 with, virtually, any two principles; that there 4 would be intention, and optimizing one could be 5 expected to come at a cost to another. 6 Q. So turning to page 16, would keeping 7 Jasper County, Dorchester County and these other 8 counties together have required tradeoffs with other 9 criteria or objectives the General Assembly might 10 have wanted to pursue? 11 A. Yes. And I will add to that there is a 12 strong possibility, and I think a possibility that's 13 reflected in various documents in this court case, 14 that the state was prioritizing criteria not named 15 in the Guidelines. In particular, partisanship is 16 not explicitly named in the Guidelines but is 17 discussed in various documents that have come out in 18 this litigation, like in the motion to dismiss and 19 the expert report of Sean Trende and so on. 20 So it's entirely possible that the State 21 had various private principles, but the publicly 22 expressed principles are the ones -- the only ones 23 that the public could have been aware of when they 24 prepared plans to submit for consideration. They 25 cannot have been aware of principles that weren't</p>	<p style="text-align: right;">Page 101</p> <p>1 A. Well, I would say that the Voting Rights 2 Act and Equal Protection do govern, in part, the 3 proper prioritization, the proper role of 4 considerations that touch on race. Are you asking 5 in that generality, or could you -- 6 Q. Yeah, I'm happy to clarify the question, 7 if that would be helpful. 8 A. I think it would. 9 Q. That's fine. I think you said that 10 you're not aware of any prohibition on considering 11 partisanship. Right? 12 A. That's right. 13 Q. So now I want to talk about the 14 difference between publicly available criteria and 15 private criteria. And so it's not necessarily a 16 question about partisanship, but the question is, is 17 there any prohibition, to your knowledge, on a map 18 drawer or General Assembly considering private 19 criteria -- 20 A. Right. 21 Q. -- that are not public? 22 A. And again, my answer is, only some. So, 23 for instance, it would not be proper, it would not 24 be legal, in my understanding, to privately choose 25 to disfavor members of a particular racial or</p>

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<p style="text-align: right;">Page 102</p> <p>1 language minority group. That's just an example. 2 But -- 3 Q. Right. I'm sorry. Finish your answer. 4 A. Just that there are very few 5 restrictions of that kind in the law that I'm aware 6 of. 7 Q. But even in that example it's not the 8 fact that that criterion is private. 9 A. That's correct. 10 Q. It's that it's illegal. 11 A. That's correct. It's not the fact of 12 having been private, but in some possibilities the 13 nature of the private motivation. 14 Q. And so focusing just on the fact that 15 something is private, does the fact that a criterion 16 is private mean a map drawer or General Assembly is 17 prohibited from considering it? 18 A. I think -- just to answer the question 19 technically first, I think they can consider 20 anything at all. However, I do think that when 21 those considerations start to come at a cost to the 22 ones that are named in law, that that's where you 23 could run into trouble. But I truly -- in an honest 24 effort to address your question as you asked it, 25 anything can be considered. But if those</p>	<p style="text-align: right;">Page 104</p> <p>1 Q. May I try to rephrase it, then? 2 A. Please. 3 Q. Would that be okay? 4 Are you aware of any prohibition on a 5 map drawer or General Assembly considering a legal 6 criterion that it has kept private and not disclosed 7 publicly? 8 A. Just to repeat, I think they are 9 allowed, legally, to consider anything that is 10 legally permissible. 11 Q. Okay. Thank you. And then my next 12 question on this is, are you aware of any 13 prohibition on a map drawer or General Assembly 14 prioritizing a legal criterion that it has kept 15 private over criteria it has made public? 16 A. Well -- 17 Q. It's a yes or no, if that's possible. 18 A. You're asking if I know of a law. 19 Right? 20 Q. Yes. 21 A. I do not know of such a law. 22 MR. GORE: Can we maybe take a minute to 23 go off the record for a second? 24 THE WITNESS: Fine with me. 25 (Discussion Off The Record)</p>
<p style="text-align: right;">Page 103</p> <p>1 considerations come at a cost to the traditional 2 principles, that might start to invite scrutiny. 3 Q. Well, it might invite scrutiny, but is 4 it illegal? 5 MS. ADEN: Objection. 6 THE WITNESS: I would say that, in my 7 understanding, that just really depends on the 8 nature of what is being prioritized. At a cost to 9 what? 10 BY MR. GORE: 11 Q. But that analysis, in your experience, 12 doesn't turn on whether the criterion is private or 13 public? 14 A. Okay. Let me -- let me disambiguate two 15 things. So one is whether something might be 16 legally suspect, and another is whether it might be 17 against the law. So I think there is a special role 18 in the law around redistricting related to -- I 19 think race, generally, is treated with a whole host 20 of special provisions in the law. In particular, 21 the role of intent versus results is special for 22 race in current law. 23 And so to your question about whether 24 private considerations are prohibited, I find that 25 question too general to answer.</p>	<p style="text-align: right;">Page 105</p> <p>1 (Break In Proceedings) 2 MR. GORE: Back on the record. 3 BY MR. GORE: 4 Q. Dr. Duchin, did you discuss this case 5 with anyone during your break? 6 A. No, I didn't talk to anyone during the 7 break. 8 Q. All right. Let's go back to your report 9 that I have pulled up here. Can you see this on 10 your screen? 11 A. Yes. 12 Q. Let's go to page 17, Figure 5. 13 A. Yes. 14 Q. Can you just tell me what these red and 15 black lines are? 16 A. Yes. The red lines are the municipal 17 boundaries of Charleston and North Charleston, and 18 the black ones are district boundaries. 19 Q. So these are not county boundaries, 20 then. Is that right? 21 A. That's right. They are municipal and 22 district boundaries. 23 Q. And I think you say here, in heading D, 24 "Charleston County split erratically." 25 A. That's right.</p>

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<p style="text-align: right;">Page 106</p> <p>1 Q. And you talk about Summerville, Ladson, 2 I hope that's how you say that, and North Charleston 3 are split in the enacted plan. Is that right? 4 A. The state has split all three cities. 5 Correct. 6 Q. And all three of these cities are 7 located in more than one county. Isn't that right? 8 A. That's right. That's what it says in 9 the previous sentence. 10 Q. So keeping these cities whole would 11 require splitting counties, wouldn't it? 12 A. That's right. You have a tradeoff here 13 between counties and cities. 14 Q. And do you know, one way or the other, 15 whether the district line in these cities deviates 16 from the county line? 17 A. This picture doesn't tell us that, but 18 I'm -- well, I will just say that, this picture 19 doesn't tell us that. 20 Q. Okay. Let's move to 5.2, which is 21 District 2 -- 22 A. Yes. 23 Q. -- on page 18 of your report. And you 24 mention that Orangeburg is separated from CD 2. 25 A. Uh-huh.</p>	<p style="text-align: right;">Page 108</p> <p>1 around which the hook wraps, has an incumbent 2 address in it. 3 Q. Do you know which incumbent? 4 A. I think that would be our District 6 5 incumbent, which is Clyburn. 6 Q. Turn to page 19. Again, Figure 7, are 7 the red lines municipal boundaries and the black 8 lines district boundaries? 9 A. That's right. 10 Q. And in C you mention splitting in and 11 around Columbia. 12 A. That's right. 13 Q. You mention Cayce, Columbia and Forest 14 Acres. Do you know whether any of these splits were 15 present in the benchmark plan? 16 A. I don't. I'm not going to -- 17 unfortunately, I'm not going to be able to answer 18 any of those kinds of questions about the benchmark 19 plan using these materials. 20 Q. Okay. And are you aware of or do you 21 recall any public testimony supporting the splits? 22 A. Supporting the splits? I do not recall 23 that. Although, again, it may exist. 24 Q. Let's go to 5.3. I think you have just 25 said that you're not in a position to answer any</p>
<p style="text-align: right;">Page 107</p> <p>1 Q. And as you sit here today, do you know 2 whether Orangeburg County was split in the benchmark 3 plan? 4 A. I don't know that from these materials. 5 Q. And are you aware of any public 6 testimony supporting this split in Orangeburg 7 County? 8 A. No, although I don't discount the 9 possibility that it exists. 10 Q. Part B mentions a hook into Columbia? 11 A. Correct. 12 Q. And I think it acknowledges that this 13 hook shape did exist in the benchmark plan. Is that 14 correct? 15 A. Yes. Hang on. That's right. It says 16 that the hook shape is preserved in the new plan 17 from its non-compact hook shape in the prior plan. 18 Q. And are you aware of any public 19 testimony supporting this hook into Columbia? 20 A. I am not, but I don't discount the 21 possibility that it was discussed. 22 Q. And are you aware of any other reason 23 for this hook into Columbia? 24 A. Well, I mean, incumbent addresses comes 25 to mind. I believe that this district, the bulb</p>	<p style="text-align: right;">Page 109</p> <p>1 questions about the benchmark plan. Is that right? 2 A. Some questions. You know, the ones -- 3 the ones I have written about. 4 Q. The specific ones. 5 A. Right. 6 Q. Okay. Then I will not bother asking you 7 those questions. You mention here, on 20, heading 8 A), "Sumter COI not respected." 9 A. Correct. 10 Q. And are you aware of any public 11 testimony supporting these splits that you describe 12 in this paragraph? 13 A. Supporting these splits, no, I am not 14 aware of that, although it may exist. 15 Q. And are you aware of any other reason 16 for these splits? 17 A. Of Sumter. Correct? 18 Q. Correct. 19 A. No. But it may exist. 20 Q. And section B) is: "Sumter split is 21 illogical." 22 A. Right. 23 Q. And you mention a precinct is split 24 along several low-density residential roads? 25 A. Yes.</p>

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<p style="text-align: right;">Page 110</p> <p>1 Q. Do you recall which precinct that is? 2 A. You mean the name of the precinct? 3 Q. Yes. 4 A. No, I do not. 5 Q. And you mention that the portion of West 6 Oakland Avenue and all of Cemetery Road appear to be 7 in the middle of a cemetery. Is that right? 8 A. That's right. And to clarify, the kinds 9 of materials that I used here were like Google 10 Street search. I can't be -- you know, that's why I 11 use phrases like "appear to be." 12 Q. Got it. Okay. With respect to a line 13 that runs through a cemetery -- 14 A. Yes. 15 Q. -- to the extent it runs through a 16 cemetery, does it split any population? 17 A. You will find, in census data, there is 18 population in the most surprising places, rivers, 19 cemeteries, so I can't be sure. But, in general, I 20 would agree with what I take to be a premise that 21 not that many people are living in cemeteries. 22 Q. Okay. And as you sit here today, you 23 don't know one way or the other whether on the 24 census data this particular stretch of road is 25 splitting any population?</p>	<p style="text-align: right;">Page 112</p> <p>1 to have some opportunity to elect and breaking it 2 into districts in a way that reduces the opportunity 3 to elect. 4 Q. Is cracking coterminous with vote 5 dilution? 6 A. No. It is one of several strategies 7 that are considered to be constitutive of vote 8 dilution. 9 Q. And in this section of your report when 10 you're referring -- when you use the term 11 "cracking," does that necessarily involve vote 12 dilution? 13 A. To make sure I understand, you're asking 14 is it possible to imagine a scenario in which there 15 is cracking but no vote dilution? Am I 16 understanding right? 17 Q. Go ahead and answer that question, and 18 then I would like to know what you were doing in 19 your report. But yes, please. 20 A. Right. In this report I'm 21 investigating -- in this section of this report I'm 22 investigating the possibility of cracking as a means 23 to dilute the vote or with the result of diluting 24 the vote. 25 Q. So is it possible to have cracking</p>
<p style="text-align: right;">Page 111</p> <p>1 A. No, I do not. 2 Q. And again, are you aware of any public 3 testimony supporting this split? 4 A. No. 5 Q. All right. Let's move on to section 6. 6 A. Yes. 7 Q. This is called: "Vote dilution compared 8 to the neutral baseline." What standard did you 9 apply to determine whether the enacted plan dilutes 10 Black voting power? 11 A. So the investigation here is into what 12 is informally called "cracking," which I can define 13 if you would like. And the way that that was 14 carried out is with a collection of figures that 15 show how Black population is distributed compared to 16 an ensemble of maps that were made with mutual 17 criteria. 18 Q. And I believe this section is titled: 19 "Vote dilution"?" 20 A. That's right. 21 Q. So can you tell me what you mean by 22 "vote dilution"?" 23 A. So generally, I'm speaking about, as I 24 said a moment ago, what is called cracking, which 25 involves taking a population that's numerous enough</p>	<p style="text-align: right;">Page 113</p> <p>1 without vote dilution? 2 A. I don't think you would call it 3 cracking. I mean, it is possible to split a 4 population without vote dilution, for instance, if 5 that population does not vote cohesively. But I 6 don't think, in general, people would use the term 7 "cracking" in such an instance. So I think the 8 weight of the term cracking, as actually employed, 9 is a subcategory of dilutive tactics. 10 Q. Here, in section 6, did you apply the 11 Gingles analysis to determine whether vote dilution 12 was present? 13 A. There is no Gingles analysis here. That 14 is, to be clear, what I mean by that, there is no 15 Gingles 1 which is a demonstrative map that 16 illustrates certain possibilities. And I did not 17 conduct Gingles 2 and 3, which are analyses of 18 racially polarized voting. 19 Q. What's the standard of vote dilution or 20 definition of vote dilution that you're applying 21 here in section 6? 22 A. I will try to quote back what I said a 23 moment ago, but at a minimum it will be a 24 paraphrase. So I'm examining cracking. And by 25 "cracking" I mean is a population that could have</p>

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<p style="text-align: right;">Page 114</p> <p>1 been numerous enough to have electoral opportunity 2 divided in such a way that diminishes their 3 electoral opportunity. 4 Q. How do you define "electoral 5 opportunity"? 6 A. So I investigate that further and 7 clarify my working definition in the next section 8 which is called: "Electoral opportunity for Black 9 voters." But broadly speaking, it is being arranged 10 across districts in such a way that the groups 11 preferred candidates, or candidates of choice may, 12 with reasonable likelihood, prevail in elections. 13 Q. Does your definition of "electoral 14 opportunity" require a majority BVAP district? 15 A. Definitely not. 16 Q. What BVAP level does your definition of 17 electoral opportunity require? 18 A. I frequently have written about this. 19 And I emphasize that it is a mistake to connect 20 electoral opportunity with a target percentage of 21 the demographic. And that is because of voting 22 patterns that sometimes have different levels of 23 support for the Black candidate of choice, for 24 example, among White voters. So it could easily 25 depend which White voters are in a district, not</p>	<p style="text-align: right;">Page 116</p> <p>1 A. Okay. Good. Just checking. 2 Q. Yeah, that's okay. I think you said -- 3 so electoral opportunity for a particular minority 4 group, let's say Black voters in South Carolina, and 5 I think you said that your definition of electoral 6 opportunity contemplates involvement of crossover 7 voting. Is that right? 8 A. It allows for the possibility of 9 crossover voting. To be clear, here, crossover 10 voting means the possibility that both Black voters 11 may not support the general Black candidate of 12 choice and the possibility that non-Black voters 13 may, nonetheless, support the Black candidate of 14 choice. 15 Q. Thank you. And the second part of that 16 is what I want to go over for just a second. So, 17 for example, in your definition does -- a district 18 that has had a BVAP level of 20 percent but an 19 additional 35 percent of the district of White 20 residents vote for the Black preferred candidate, 21 does that district represent an electoral 22 opportunity for the Black voters? 23 A. I understand your question, I think. So 24 that is, whether that would count as a district that 25 would be -- sorry, but just -- I'm going to do a</p>
<p style="text-align: right;">Page 115</p> <p>1 just how many. 2 Q. So does your definition of electoral 3 opportunity then contemplate crossover voting? 4 A. Yes. 5 Q. So you would view a -- would you view a 6 district that is providing an electoral opportunity 7 if the minority group can elect its candidate of 8 choice only in combination with certain White 9 voters? 10 A. Well, I would like to emphasize that I 11 am -- the terminology that I use overlaps 12 substantially with the terminology used by courts. 13 But I would like to emphasize again, as I said 14 earlier, that I'm resisting making legal 15 conclusions. And so when I use the term "electoral 16 opportunity" I mean what I said a moment ago, which 17 is the creation of a district in which candidates of 18 choice have a realistic chance of being elected. 19 Q. Right. And thank you. I'm trying to 20 unpack that a little bit because you are using 21 terminology that's similar to court terminology, and 22 I'm trying to understand if there are conceptual 23 differences in how you concede electoral 24 opportunity. And I don't think I was intending to 25 ask a legal question, so let me try it again.</p>	<p style="text-align: right;">Page 117</p> <p>1 little bit more of this qualifying language. 2 Whether that would be considered by a court as a 3 remedial district is not a matter I am opining on. 4 But my definition of electoral opportunity has to do 5 with electoral history and, in particular, it has to 6 do with whether identified Black candidates of 7 choice fared well in their elections if you look at 8 the precincts that make up a particular district. 9 So this definition does not have a role 10 for BVAP within it. It is certainly possible -- if 11 one wants to develop this definition in order to 12 better fit the requirements of a court, it's 13 certainly possible to take the Black population 14 level into account separately, as I have done in 15 some of my published work. In this report I look 16 only at the electoral history. 17 Q. Got it. Okay. That's helpful. I want 18 to understand the implications of your definition of 19 electoral opportunity. Because your definition 20 doesn't examine or require a particular BVAP level, 21 is it possible to have districts that provide an 22 electoral opportunity at, say, a 20 percent BVAP 23 level, not because you're examining that but just 24 because that happens to be an opportunity district, 25 under your definition?</p>

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<p style="text-align: right;">Page 118</p> <p>1 A. It's theoretically possible.</p> <p>2 Q. And so your definition of "electoral</p> <p>3 opportunity" is not the Gingles requirements or the</p> <p>4 Gingles definition of vote dilution under section</p> <p>5 II. Is that right?</p> <p>6 A. That's right. This is not intended to</p> <p>7 be a section II inquiry.</p> <p>8 Q. And I think you said that you defined</p> <p>9 electoral opportunity as an arrangement under which</p> <p>10 the groups' preferred candidates has, I think, a</p> <p>11 reasonable opportunity to be elected, is that right,</p> <p>12 or something along those lines?</p> <p>13 A. I think I said a realistic opportunity,</p> <p>14 but --</p> <p>15 Q. Realistic. Yeah. And I'm not trying to</p> <p>16 put words in your mouth. I want to use your</p> <p>17 phraseology. How would you define a "realistic</p> <p>18 opportunity"?</p> <p>19 A. Well, what I have done here is I have</p> <p>20 taken four elections that were identified as</p> <p>21 probative by counsel, as I say very clearly in our</p> <p>22 report, and identified these four Black candidates</p> <p>23 of choice, Whittenburg, Glenn, Harrison and the</p> <p>24 Biden/Harris ticket. And in order to assess whether</p> <p>25 such a candidate, a similar candidate would have a</p>	<p style="text-align: right;">Page 120</p> <p>1 don't know that anyone else would have constructed</p> <p>2 the definition in exactly the same way, but I think</p> <p>3 this kind of analysis, which sometimes goes by the</p> <p>4 name of "reinstated election analysis," is</p> <p>5 entirely standard in the field.</p> <p>6 Q. Let's take it away from South Carolina</p> <p>7 for a moment. Reconstituted election analysis, you</p> <p>8 say is common in other places or as a general matter</p> <p>9 in redistricting or other voting rights analysis.</p> <p>10 Is that right?</p> <p>11 A. That's right.</p> <p>12 Q. And within that reconstituted election</p> <p>13 analysis is there a definition or a standard to</p> <p>14 determine realistic opportunity for a group to elect</p> <p>15 its preferred candidate?</p> <p>16 A. I don't think that I have encountered</p> <p>17 any proposed bright line. I will add to that that</p> <p>18 there are very few bright lines in this business,</p> <p>19 although one of them is present in Gingles 1, thanks</p> <p>20 to Bartlett v Strickland, in which 50 percent was</p> <p>21 clarified as a kind of fundamental level at which</p> <p>22 there is a meaningful shift in the finding. This</p> <p>23 is, again, not a section II analysis.</p> <p>24 Q. Are you aware of any academic</p> <p>25 literature, peer-reviewed literature that has</p>
<p style="text-align: right;">Page 119</p> <p>1 reasonable opportunity to be elected, I look at the</p> <p>2 major party vote share earned by each of these</p> <p>3 candidates in the district. If they won outright,</p> <p>4 then the district does seem to be effective for</p> <p>5 candidates like them.</p> <p>6 I also, in a few places, note where they</p> <p>7 may not have won outright but got within a 5-point</p> <p>8 margin, and I see those as ones in which a similar</p> <p>9 candidate might have a realistic.</p> <p>10 Opportunity. But one thing I will add</p> <p>11 to that, just to give context, is I don't mean for</p> <p>12 that 5-point margin to be, you know, a bright line</p> <p>13 or anything very formal. It is intended to give</p> <p>14 evidence that the candidate was in contention.</p> <p>15 Q. So you believe that, just so I</p> <p>16 understand, not as a bright line, but the</p> <p>17 5 percent -- the 5-point margin defines whether</p> <p>18 there is a realistic opportunity or not?</p> <p>19 A. No, I don't propose it as a definition,</p> <p>20 just as an indication.</p> <p>21 Q. How does a map drawer know whether the</p> <p>22 map he or she has drawn provides a realistic</p> <p>23 opportunity, under your definition?</p> <p>24 A. Well, my specific definition, which</p> <p>25 involves using these four particular elections -- I</p>	<p style="text-align: right;">Page 121</p> <p>1 adopted or discussed your definition of electoral</p> <p>2 opportunity?</p> <p>3 A. Yes. The idea that electoral</p> <p>4 opportunity can be gauged by selecting probative</p> <p>5 elections and doing -- I don't personally love the</p> <p>6 term "reconstituted," but I recognize that others</p> <p>7 use that term. So reconstituted election analysis</p> <p>8 on probative elections, yes, absolutely, that's</p> <p>9 throughout the peer-reviewed literature.</p> <p>10 Q. Well, what about this concept of</p> <p>11 realistic possibility, I think is what you said, is</p> <p>12 that --</p> <p>13 A. I think people discuss realistic</p> <p>14 opportunity throughout the peer-reviewed literature.</p> <p>15 And just to give you some other phrases that are</p> <p>16 sometimes used in connection with that concept, in</p> <p>17 the law, the suggestion that groups should have to,</p> <p>18 so-called, pull, haul and trade in order to get</p> <p>19 their preferred candidates elected, that's a phrase</p> <p>20 that you hear echoed many times.</p> <p>21 The idea that candidates might get close</p> <p>22 and that would give an indication they could have</p> <p>23 prevailed, that is, again, a really widespread</p> <p>24 notion in both litigation and in the peer-reviewed</p> <p>25 literature.</p>

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<p style="text-align: right;">Page 122</p> <p>1 And in my own writing I have frequently 2 talked about the relevance of candidates having been 3 close to a majority of the two-way vote. I can cite 4 several papers where I have written about that.</p> <p>5 Q. I'm trying to understand this in a 6 little bit more practical terms. If I were advising 7 a map drawer to draw maps that have realistic 8 possibility or probability of election in order to 9 guarantee electoral opportunity, what would I tell 10 map the drawer to do?</p> <p>11 A. Well, I think that's not a cut-and-dried 12 question. And I could certainly imagine telling a 13 map drawer to draw districts where previous 14 candidates would have prevailed. I can imagine 15 telling a map drawer to draw districts where they 16 would have prevailed comfortably, or I could imagine 17 instructing a map drawer to draw districts where 18 they would have been close. All of those seem like 19 reasonable sets of instructions.</p> <p>20 Q. But under your definition it's not 21 necessary to draw a district in which the 22 minority-preferred candidate necessarily will 23 prevail.</p> <p>24 A. Necessarily will prevail, definitely 25 not. I don't even think that's possible.</p>	<p style="text-align: right;">Page 124</p> <p>1 standard.</p> <p>2 Q. And this section is titled: "Vote 3 dilution."</p> <p>4 A. Section 7?</p> <p>5 Q. Section 6. I'm sorry. Section 6 on the 6 screen here, which is on page 22.</p> <p>7 A. Yes. It's "Vote dilution compared to 8 the neutral baseline."</p> <p>9 Q. And I may have already asked this, but 10 I'm not sure I'm clear on the answer. How do you 11 define "vote dilution"?</p> <p>12 A. I haven't offered a definition of vote 13 dilution, you know, in its entirety, but I have 14 discussed a variety of vote dilution, which is 15 called "cracking." And I can redefine that, but I 16 think I have tried already twice to give a 17 definition of cracking. And that's what I mean here 18 as an instance of vote dilution. So when I say, 19 "Vote dilution compared to the neutral baseline," I 20 could equally have titled this section "Cracking 21 compared to the neutral baseline."</p> <p>22 Q. What is the neutral baseline you used 23 here in section 6?</p> <p>24 A. Okay. I used Python tools to build what 25 I call ensembles, which are just collections of</p>
<p style="text-align: right;">Page 123</p> <p>1 Q. You don't think there are districts in 2 which a minority candidate necessarily will prevail?</p> <p>3 A. In the business of voting, I don't mean 4 this glibly at all, but almost nothing is 5 guaranteed. So you can draw very high-probability 6 districts, but I think certainty is illusive when it 7 comes to voting.</p> <p>8 Q. Okay. Well, what about District 6 in 9 South Carolina, is that a high probability? How 10 would you define the probability of Congressman 11 Clyburn prevailing in District 6?</p> <p>12 A. Well, I frequently say that I'm not in 13 the business of making election predictions. I do a 14 lot of modeling, and I would describe that as a 15 district that looks effective from the point of view 16 of the analysis presented here. It looks quite 17 effective.</p> <p>18 Q. To your knowledge, has any court adopted 19 your definition of "electoral opportunity"?</p> <p>20 A. Yes. I would say broadly. I mean, of 21 course, no court has adopted a definition that takes 22 these four particular elections. And so when you 23 say "your definition," there is room for a range of 24 specificity. But I think, to a reasonable degree of 25 specificity, yes, I'm describing something entirely</p>	<p style="text-align: right;">Page 125</p> <p>1 alternative districting plans that operationalize 2 the rules as I understand them.</p> <p>3 Q. Has the ensemble method been accepted by 4 any court in a racial gerrymandering case?</p> <p>5 A. I could not answer authoritatively 6 whether any court has accepted ensembles in a racial 7 gerrymandering context, but I have been involved, as 8 I mentioned before, in numerous cases in the cycle 9 in which ensemble evidence was used, including in a 10 racial fairness context.</p> <p>11 Q. So as I understand the ensemble method, 12 you program an algorithm to consider certain rules, 13 and then the algorithm generates plans based upon 14 those rules. Is that right?</p> <p>15 A. Yes, that's right, broadly.</p> <p>16 Q. Okay. I would like to understand a 17 little bit better what you program the algorithm to 18 do.</p> <p>19 A. Yes.</p> <p>20 Q. So I think we are on page 22 here.</p> <p>21 A. Sure.</p> <p>22 Q. First you say: "Population balance and 23 contiguity are enforced throughout the algorithm?"</p> <p>24 A. Yes.</p> <p>25 Q. What standard of population balance did</p>

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<p style="text-align: right;">Page 126</p> <p>1 you use?</p> <p>2 A. This is described in a bit more detail</p> <p>3 on page 29 where I explain that I compared runs with</p> <p>4 a population deviation of 2 percent, 1 percent and</p> <p>5 half a percent. There is a supplementary kind of</p> <p>6 analysis that helps to increase my confidence that</p> <p>7 the population balance enforced by the algorithm is</p> <p>8 appropriate to the problem at hand, and that is to</p> <p>9 experiment with tuning those plans from the ensemble</p> <p>10 to one-person deviation. So should I describe that?</p> <p>11 Q. Please.</p> <p>12 A. I don't want to give any more details</p> <p>13 than you want, because I know I can get away into</p> <p>14 the weeds on this.</p> <p>15 Q. Please go ahead.</p> <p>16 A. Sure. Okay. So I have two kinds of</p> <p>17 tuning protocols that I use to convince myself that</p> <p>18 in a particular redistricting setting a 1 percent,</p> <p>19 say, deviation is adequate to understand</p> <p>20 Congressional redistricting in which, as we have</p> <p>21 already discussed, the usual standard for adoption</p> <p>22 is a one-person deviation.</p> <p>23 So I have done -- I routinely do two</p> <p>24 kinds of analysis, and did try them here in South</p> <p>25 Carolina, and those are to run an auto-tuning</p>	<p style="text-align: right;">Page 128</p> <p>1 understand, these 100,000 alternative plans each, or</p> <p>2 however many the total number was, were drawn with a</p> <p>3 population deviation as great as 2 percent. Is that</p> <p>4 right?</p> <p>5 A. The ones that appear in the figures are</p> <p>6 drawn with 1 percent. That's right.</p> <p>7 Q. And by "the figures," do you mean, for</p> <p>8 example, Figure 10 here on page 23?</p> <p>9 A. There are exactly three figures that use</p> <p>10 ensembles, and those are Figures 10, 11 and 12.</p> <p>11 Q. All right. Now back to page 22, I think</p> <p>12 you said the ensemble method is implemented with a</p> <p>13 presence for compactness --</p> <p>14 A. That's right.</p> <p>15 Q. -- for the preservation of counties and</p> <p>16 municipalities.</p> <p>17 A. That's right.</p> <p>18 Q. Can you tell me what you did to program</p> <p>19 these preferences in the algorithm?</p> <p>20 A. I certainly can. And here you should</p> <p>21 give me guidance as to the detail level that you</p> <p>22 like because, to me, this is a really fascinating</p> <p>23 research area. So I will try first with a high</p> <p>24 level of generality, and then just tell me how</p> <p>25 specific you would like to get.</p>
<p style="text-align: right;">Page 127</p> <p>1 algorithm that swaps blocks at a small level until</p> <p>2 the population is tuned to one person, and to have a</p> <p>3 human, in this case me, hand-tune the maps to a</p> <p>4 one-person deviation. And the purpose of those</p> <p>5 tuning experiments is to boost my confidence that</p> <p>6 1 percent maps can quickly be tuned to one person</p> <p>7 without breaking any of their metric properties.</p> <p>8 That is the kind of justification that is properly</p> <p>9 done, in my view, to build ensembles at something</p> <p>10 like 1 percent deviation and to have a high</p> <p>11 confidence that they will be relevant to one-person</p> <p>12 redistricting requirements.</p> <p>13 Q. I would like to turn back now to page 22</p> <p>14 and then carry it over -- you mention several</p> <p>15 ensembles of 100,000 alternative plans each.</p> <p>16 A. Yes.</p> <p>17 Q. Were any of those plans drawn to a</p> <p>18 one-person, top-to-bottom deviation?</p> <p>19 A. I can't say whether that occurred in the</p> <p>20 1 percent ensembles, but I can say that I</p> <p>21 experimented with tuning selected plans from the</p> <p>22 ensembles and always found it to be quickly tunable</p> <p>23 to one person without breaking the other relevant</p> <p>24 properties.</p> <p>25 Q. And with respect to -- just so I</p>	<p style="text-align: right;">Page 129</p> <p>1 Okay. The ensemble method here is</p> <p>2 conducted with what's called a "Markov chain." And</p> <p>3 Markov chains are sequences of random</p> <p>4 transformations. In this case, an innovation that</p> <p>5 my research group has introduced into the field of</p> <p>6 computational redistricting is the use of what are</p> <p>7 called "spanning trees." Spanning trees. And the</p> <p>8 process of moving from plan to plan is to fuse two</p> <p>9 districts, select a random spanning tree, cut that</p> <p>10 tree and that produces two new districts. That</p> <p>11 process has been analyzed in multiple peer-reviewed</p> <p>12 papers as one that promotes compactness. And the</p> <p>13 way that it does that is to up-weight -- so all of</p> <p>14 these Markov chain methods employ randomness. And</p> <p>15 that means they are probabilistic. These methods</p> <p>16 put a much higher probability on selecting a plan</p> <p>17 that is more compact in a metric that relates</p> <p>18 closely to the block cut edges metric that was</p> <p>19 discussed earlier. So it is not certain that you</p> <p>20 will choose a compact plan, but it is far more</p> <p>21 likely that you will choose a more compact plan.</p> <p>22 And, in fact, how much more likely it is is in</p> <p>23 proportion to that compactness. That's how</p> <p>24 compactness is promoted. Is that the right level of</p> <p>25 detail?</p>

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<p>1 Q. That's fine.</p> <p>2 How about preservation of counties and</p> <p>3 municipalities?</p> <p>4 A. That's done differently. And this is</p> <p>5 also something that I think is quite conceptually</p> <p>6 powerful. Here is how that's done. So it mentions</p> <p>7 that when you fuse two districts you then draw, at</p> <p>8 random, an object called a "spanning tree." Now,</p> <p>9 there are several randomized algorithms for choosing</p> <p>10 spanning trees. You could choose them uniformly,</p> <p>11 but an even faster and more efficient thing to do is</p> <p>12 to put random weights on the edges and then choose a</p> <p>13 minimum-weight spanning tree. Sorry to be a math</p> <p>14 professor, but that's how -- for a moment I will</p> <p>15 need to do that to explain this properly. So there</p> <p>16 is a classic algorithm to do that called "Kruskal's</p> <p>17 algorithm," which is what we use.</p> <p>18 What we do to promote the integrity of</p> <p>19 counties and cities is to put different weights on</p> <p>20 edges within a county and edges between counties.</p> <p>21 By putting a higher weight on edges within counties,</p> <p>22 we tend to probabilistically prioritize trees that</p> <p>23 stay within the county. And that means when you cut</p> <p>24 an edge of the tree it becomes far more likely that</p> <p>25 counties will be kept together.</p>	<p>Page 130</p> <p>1 that's a preference with respect to other plans</p> <p>2 drawn in the ensemble plans. Is that right?</p> <p>3 A. That's right. You should imagine that</p> <p>4 there are trillions of possible plans, and each of</p> <p>5 them is being selected by the algorithm with some</p> <p>6 probability. So "preference" means a higher</p> <p>7 probability weight on plans that are more compact</p> <p>8 and split fewer counties.</p> <p>9 Q. Your next sentence says: "I performed</p> <p>10 runs which attempt to prioritize the preservation of</p> <p>11 certain communities of interest identified in public</p> <p>12 testimony and runs that did not operationalize the</p> <p>13 COI concept." Which communities of interest did you</p> <p>14 attempt to prioritize?</p> <p>15 A. That's precisely the ones shown in</p> <p>16 Figure 13 on page 30, exactly those.</p> <p>17 Q. How did you choose those communities of</p> <p>18 interest to prioritize?</p> <p>19 A. I believe we discussed that at some</p> <p>20 length before lunch.</p> <p>21 Q. Is it the same method?</p> <p>22 A. Oh, absolutely. This is -- the idea</p> <p>23 here was to make a good-faith effort to complete a</p> <p>24 thorough review of public testimony, find places</p> <p>25 frequently mentioned, try to understand the reasons</p>
<p>1 One thing I will add is that our method</p> <p>2 has a feature that I think is very helpful for</p> <p>3 problems for applications to redistricting, which is</p> <p>4 because this is done with a random weight, the</p> <p>5 importance placed on county preservation can be</p> <p>6 interpolated between zero and 100 percent. So if</p> <p>7 you find that full weight on county preservation</p> <p>8 goes too far and produces maps that cut way fewer</p> <p>9 counties than the ones made by people, you can dial</p> <p>10 down the weight on county preservation in order to</p> <p>11 be producing maps that are similar to the ones that</p> <p>12 were made by the decision-makers.</p> <p>13 In this case of South Carolina, we found</p> <p>14 that the number of county splits in our ensemble was</p> <p>15 comparable to some of the better maps made by</p> <p>16 people. And that's a way of telling that you</p> <p>17 haven't overshot the mark.</p> <p>18 Q. And that particular conclusion about</p> <p>19 county splits being comparable to other plans, is</p> <p>20 that anywhere in your report?</p> <p>21 A. That sentence, no. That's a standard</p> <p>22 element of the methodology which I described in</p> <p>23 peer-reviewed articles also.</p> <p>24 Q. Just so I understand, when you talk</p> <p>25 about a preference for compactness and preservation,</p>	<p>Page 131</p> <p>1 people gave for citing these communities, make sure</p> <p>2 they were in line with reasons named by the State as</p> <p>3 legitimate, and recognizing this as selective to</p> <p>4 operationalize this as a working concept. Let me</p> <p>5 emphasize, when I say this, I certainly do not</p> <p>6 represent this as the only way of taking COIs into</p> <p>7 account. This is part of a robustness check that I</p> <p>8 like to perform whenever I do ensemble analysis to</p> <p>9 show that at least some effort to keep COIs whole</p> <p>10 wasn't having a wholesale distorting effect on the</p> <p>11 other measurable properties of the plans. And I can</p> <p>12 confirm that it was not.</p> <p>13 So the idea here is to have this toggle,</p> <p>14 COI toggle. Turn it on and there is one particular</p> <p>15 way. Turn it off, see if that changes the</p> <p>16 measurable properties and the plans that are</p> <p>17 relevant in Figures 10, 11 and 12. I find that it</p> <p>18 does not.</p> <p>19 Q. And when you say, "did not</p> <p>20 operationalize the COI concept," for a layperson</p> <p>21 like me does that mean turning off COI toggle, to</p> <p>22 borrow your analogy?</p> <p>23 A. That's exactly what I mean.</p> <p>24 Q. The next sentence says that: "Ensemble</p> <p>25 generation made no use of race data." Does that</p>

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<p style="text-align: right;">Page 134</p> <p>1 mean that you turned off race data in the ensemble 2 plans or something else? 3 A. That means that the algorithm does not 4 use the race field. 5 I want to say something that I think is 6 very important for reasoning about ensembles and 7 race, which is, I think that everything else that's 8 in the ensemble has racial factors subtly proxied. 9 For example, the boundaries of counties and 10 municipalities can well have an important racial 11 history. And I don't mean to deny that at all, only 12 to say that in this collection of ensemble runs the 13 race field and the data was simply not used by the 14 algorithm.</p> <p>15 Q. And the rest of that sentence says that 16 the plans are neutral with respect to all other 17 properties except those listed here. Does that mean 18 the ensemble plans don't consider data on other 19 traditional districting principles or those 20 principles at all?</p> <p>21 A. It does mean that. And it also means 22 something stronger, which is that the -- those of us 23 who study computational redistricting, we think 24 about, as I was referring to earlier, the 25 probability distribution from which we are sampling</p>	<p style="text-align: right;">Page 136</p> <p>1 A. Can I do that here? I did look at 2 incumbency in the South Carolina House, but I think 3 for Congress I did not. Let me look again at the 4 description in appendix A. I don't see incumbency 5 described. And that means in this report I did not 6 look at incumbencies.</p> <p>7 Q. Section 6.1 is a statewide analysis -- 8 or at least it's headed as a statewide analysis. 9 And you say -- and I don't mean to suggest it's not. 10 I'm just trying to be as accurate as you are, which 11 you're setting a high standard. The first sentence 12 says: "Using neutral ensembles of districting maps, 13 we can compare the properties of a plan to 14 alternative statewide plans that were made under 15 traditional criteria." Are these alternative 16 statewide plans that were made under traditional 17 criteria the ensemble plans made with the parameters 18 we have been discussing?</p> <p>19 A. Yes, that's right.</p> <p>20 Q. Or are they different? There are not 21 any different set of plans?</p> <p>22 A. No. We just described the comparative.</p> <p>23 Q. Okay. And as I understand what you have 24 shown here, we will move here to District -- maybe 25 to Figure 10, but I think it's also on page 22, what</p>
<p style="text-align: right;">Page 135</p> <p>1 So I'm not only saying that we didn't use a field in 2 the data that has to do with other features, I'm 3 also saying that I can characterize the limiting 4 distribution and it depends only on the named 5 features, the limiting distribution does, which is 6 to say -- well, let me rephrase that in a way that I 7 think is maybe clearer. If you take two plans and 8 you ask how much more likely is it to see this than 9 this, I can answer that quantitatively. And I know 10 that it depends only on the things that are 11 described here.</p> <p>12 Q. So when the algorithm is drawing the 13 plans in the ensemble approach or in the ensemble 14 plans does it consider preservation of cores?</p> <p>15 A. I have done that in some studies. I did 16 not do that here.</p> <p>17 Q. Okay. And focusing again on what you 18 did here for South Carolina on the Congressional 19 plan, does the algorithm consider VTD splits?</p> <p>20 A. Yes. Because it only builds from whole 21 VTDs. It does not split any VTDs.</p> <p>22 Q. And does it consider partisan 23 performance in any districts?</p> <p>24 A. Certainly not.</p> <p>25 Q. How about incumbency pairing?</p>	<p style="text-align: right;">Page 137</p> <p>1 you're getting at here is the demographic statistics 2 of the districts with the second highest BVAP. Is 3 that right?</p> <p>4 A. That's correct. Let me clarify 5 something which I had to refresh myself while I was 6 rereading this report. In the statewide plot, 7 that's the second highest out of seven. And in a 8 focused area plot, it's the second highest out of 9 four.</p> <p>10 Q. So why choose the second highest 11 district, as opposed to all other districts or some 12 other district?</p> <p>13 A. Because, as it says here, the complaint 14 specifically seeks relief for the dilution of Black 15 voters in 1, 2 and 5. I have included District 6 16 because it connects 1, 2 and 5 geographically, but 17 it is not being challenged or named in the 18 complaint. That's the district with the highest 19 BVAP, and that's why I looked at the second highest.</p> <p>20 Q. And you say, in 6.1 -- I think the third 21 sentence says: "Cracking would tend to show up as 22 unusual low BVAP in the second-highest district." 23 Is there any peer-reviewed literature to support 24 that statement?</p> <p>25 A. Sure. Let's be clear on the logic of</p>

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<p style="text-align: right;">Page 138</p> <p>1 that statement. So let me try to explain the logic 2 of that statement. So again, with apologies for 3 repetition, cracking is taking population that could 4 have been numerous enough to exert electoral control 5 and distributing it in such a way that it is 6 dispersed and does not -- the population does not 7 have an opportunity for electoral control.</p> <p>8 So in this context -- and this is 9 context specific, in this context cracking would 10 mean since the highest district is not alleged to be 11 packed or cracked, cracking would mean a depression 12 of BVAP and potentially also crossover votes in the 13 next district which, in this case, is the second 14 highest. So yes, I think this is totally standard 15 as an understanding of cracking.</p> <p>16 Q. And are you aware of any court opinions 17 that adopt that logic when analyzing cracking or 18 vote dilution issues?</p> <p>19 A. Sure. I couldn't name a case on the 20 spot, but again, I really do think this is quite 21 standard that -- to put it -- to phrase it a 22 different way, sometimes there is packing 23 accompanied by cracking, and sometimes there is a 24 district that is not problematic accompanied by 25 cracking.</p>	<p style="text-align: right;">Page 140</p> <p>1 District 2. 2 Q. And back on page 23, if I'm reading this 3 correctly, each of these shaded boxes, does it cover 4 a range of 1 percent BVAP or not necessarily? 5 A. I do not remember the width of the bins. 6 So it might be 1 percent. It's certainly in the 7 neighborhood of 1 percent. 8 Q. Okay. And you say here that the State's 9 plan is especially low, which I understand to be the 10 25.4 percent number? 11 A. Yes. Low in comparison with the 12 histogram. That's right. 13 Q. With the histogram. Right. 14 A. In fact, it's in the lowest visible bar. 15 Q. But what is the standard for determining 16 whether a district is especially low? 17 A. The term "especially" is not meant to be 18 a term of art. And I think you will find that if 19 you look at the way ensemble evidence has been 20 interpreted, consistently, both researchers and 21 courts have been resistant to specify a cutoff for 22 what an outlier -- of what would constitute an 23 outlier. But I think being in the lowest visible 24 bar is a very good indication of being especially 25 low.</p>
<p style="text-align: right;">Page 139</p> <p>1 Here, the focus on second highest is 2 because we are setting aside District 6. So the 3 idea then that cracking would show up as unusually 4 low BVAP, completely standard and accepted by 5 courts, in my view.</p> <p>6 Q. Let's go to Figure 10, if we can, just 7 for a moment. It's on the top of page 23. And this 8 is a histogram. And I understand that the kind of 9 shaded boxes are a distribution of the ensemble 10 plans. Is that correct?</p> <p>11 A. Exactly.</p> <p>12 Q. And here the enacted plan's second 13 highest BVAP district has a BVAP, it appears, of 14 25.4 percent. Is that right?</p> <p>15 A. That's right. That's what it says in 16 the key.</p> <p>17 Q. And do you recall which district that 18 is?</p> <p>19 A. We can easily find that out.</p> <p>20 Q. Let's go back. I think it's on page 9 21 of your report -- or page 8 maybe?</p> <p>22 A. Let's find it. 25.4, that's District 2. 23 Actually, it's a tie between District 2 and 7. So 24 in the statewide it could be either. But in the 25 restriction to Districts 1, 2, 5 and 6 it would be</p>	<p style="text-align: right;">Page 141</p> <p>1 Q. But as you said, there is no specific 2 standard as to what constitutes an outlier. 3 Correct? 4 A. That's right. There is no universal 5 standard.</p> <p>6 Q. And you say that the most neutral plans 7 are at or near the 30 percent BVAP. Is that right? 8 A. Yes, it does say that. 9 Q. And you're referring to, kind of, the 10 shaded boxes there that more or less anchor around 11 .3? 12 A. That's right. Sorry to interrupt. What 13 you might call the bulk of the ensemble looks to be 14 occurring at 30 percent plus or minus, you know, 5. 15 Q. Do you happen to know what the average 16 BVAP in the second highest BVAP district in the 17 ensemble plans is? 18 A. I don't have that number in front of me. 19 Q. And it looks like the largest tranche is 20 this tallest box here which, as we discussed, may be 21 29 percent to 30 percent, or something in that 22 range, because we don't -- stipulating we don't know 23 what the range is that's being shown by that box. 24 A. No, I do think it is 1 percent, as you 25 said, because it looks like there are ten histogram</p>

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<p style="text-align: right;">Page 142</p> <p>1 bars between 30 and 40 percent. So I think 2 1 percent is right. 3 You're right that the highest bar is the 4 one from 29 to 30 percent. But this is important to 5 know if you're working with data of this kind, the 6 location of the highest bar really depends on how 7 fat your bins are. So if I made the bins half a 8 percent instead of a full percent, we might have a 9 different highest bar. It's not quite the same as 10 what is sometimes called the "mode" in statistics, 11 the most common value. This is binned, or 12 aggregated data, and so the identity of the highest 13 bar could change with the width of the bins.</p> <p>14 Q. Thank you for that clarification. 15 So Figure 10, it has the line for the 16 enacted plan at 25.4 percent. And it also shows the 17 Harpootlian and NAACP1. Is that right? 18 A. That's right. 19 Q. And for both of those lines they are 20 higher than that 30 percent range you identified for 21 the neutral plans. Is that right? 22 A. Well, I wouldn't call 30 percent a 23 range. I would say that, you know, 30 percent, plus 24 or minus a few percentage points, is where the bulk 25 of this ensemble is. And I agree with you that both</p>	<p style="text-align: right;">Page 144</p> <p>1 statewide is 25.4, just like District 7. And it may 2 be identical to District 7. If you focus on 3 Districts 1, 2, 5 and 6, as I do in some parts of 4 the report, then the second highest is 24 percent. 5 Q. And you said you focused on 1, 2, 5 and 6 6 in the next portion of your report which we will 7 get to, but in the enacted plan what's the BVAP in 8 the second highest BVAP district among those 9 districts? 10 A. It's still 25.4. 11 Q. And then the LWV plan statewide, what's 12 the BVAP in the second highest BVAP district in that 13 plan? 14 A. Statewide, it looks like it's 24.5, but 15 please correct me if I'm misreading. 16 Q. It looks like 24.5, at least to me, so 17 we will go with that. So in the LWV plan, the 18 second highest BVAP district has a lower BVAP than 19 the second highest BVAP district in the enacted 20 plan? 21 A. Yes. 22 Q. And in the SC-NAACP2 plan, the second 23 highest BVAP district has the same BVAP as the 24 second highest BVAP district in the enacted plan? 25 A. Correct.</p>
<p style="text-align: right;">Page 143</p> <p>1 the green and the red line, which represent 2 Harpootlian and NAACP1, are relatively high. They 3 don't share the property with the enacted plan of 4 being in the most extreme bar that occurred, but 5 they are relatively high. Agreed. 6 Q. And is there a reason why Figure 10 7 doesn't have lines for NAACP2 or the League of Women 8 Voters plans? 9 A. There were eleven plans overall. And I 10 believe I did generate a picture that had them all 11 and it was quite cluttered, so I chose to focus on a 12 few. 13 Q. I would like to turn back to page 8 of 14 your report. 15 A. Sure. 16 Q. Maybe it's page 9. I apologize. And I 17 want to start with the NAACP2 plan. 18 A. Yes. 19 Q. What is the BVAP in the second highest 20 BVAP district in that plan? 21 A. Statewide, it is 25.4. And let me just 22 say I'm attempting to read numbers live. I might 23 make mistakes. 24 Q. That's okay. 25 A. It looks like NAACP2, the second highest</p>	<p style="text-align: right;">Page 145</p> <p>1 Q. So if we return to page 23 on this 2 histogram, the SC-NAACP2 line would be the same as 3 the enacted plan line. Correct? It says 25.4 4 percent. 5 A. You're challenging my memory, but I 6 think that's right. I think that's right. 7 Q. And the LWV plan, because it's slightly 8 lower, would be somewhere to the left of that line. 9 Is that correct? 10 A. 24, I think it was. 11 Q. Yes, 24, as opposed to 25.4. 12 A. That is definitely to the left. 13 Q. So in your opinion, are those plans 14 cracked? 15 A. I don't think that they are. Although, 16 let me just say, which I think is quite important, 17 the function of this report is not to defend those 18 plans. But I think that's important to point out. 19 But, you know, the electoral opportunity, I'm not 20 sure whether I evaluated it in those plans. Oh. I 21 did. I see. I do have an effectiveness by plan 22 table in Table 7, which I assume we will get to 23 shortly. 24 Q. We will. 25 A. So it's that they have a low BVAP, but,</p>

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<p style="text-align: right;">Page 146</p> <p>1 as I have emphasized, that you have to understand 2 effectiveness in the context of which Black voters 3 and which non-Black voters are in the districts. I 4 do agree that they have lower or equal BVAP to the 5 enacted plan which is, I think, what you asked.</p> <p>6 Q. Yeah. And I understood that section 6 7 was an attempt to analyze whether cracking was 8 present. Is that right?</p> <p>9 A. Yeah, it was an attempt to analyze the 10 distribution of BVAP with respect to the ensemble. 11 So I agree that those plans are pretty low.</p> <p>12 Q. Would they be especially low?</p> <p>13 A. Yes, they would be especially low 14 compared to the ensemble. That's correct.</p> <p>15 Q. And in the ensemble plans, do any of the 16 ensemble plans have a highest BVAP district with a 17 BVAP lower than enacted District 6?</p> <p>18 A. Oh, boy. A highest BVAP district lower. 19 I don't think I have got that question answered in 20 the report. I think I always look -- I think -- but 21 you can correct me, please, if I am mistaking 22 something, I think I always look at the second 23 highest, and so I don't have that set of numbers in 24 front of me.</p> <p>25 Q. Okay. And as I understand the way you</p>	<p style="text-align: right;">Page 148</p> <p>1 histogram, is just showing the distribution of those 2 ensemble plans in this kind of bar chart form. Is 3 that right?</p> <p>4 A. That's right. It's a new set of 100,000 5 plans.</p> <p>6 Q. And it looks like the majority of 7 ensemble plans in this focused area ensemble have a 8 second highest BVAP district of less than 9 30 percent. Is that right?</p> <p>10 A. I agree that to my eye it looks like 11 more than half the mass is to the left of 12 30 percent.</p> <p>13 Q. And these were drawn with the same 14 criteria --</p> <p>15 A. Yes.</p> <p>16 Q. -- that we discussed before for the 17 other set of ensemble maps. Is that correct?</p> <p>18 A. Yes, they were.</p> <p>19 MR. GORE: So I'm about to move into 20 section 7. We have been going for just about an 21 hour on the nose. Would anybody like to take a 22 break?</p> <p>23 (Break In Proceedings)</p> <p>24 MR. GORE: So let's go back on the 25 record.</p>
<p style="text-align: right;">Page 147</p> <p>1 programmed the algorithm, the algorithm did not 2 require that the plan be drawn with a district that 3 has a BVAP as high as enacted District 6, right, 4 because you didn't direct it to consider race at 5 all?</p> <p>6 A. That's correct.</p> <p>7 Q. All right. Let's go to the "Focused 8 area" in 6.2.</p> <p>9 A. Yes.</p> <p>10 Q. And I just want to confirm that all of 11 the -- the first thing I want to confirm is that the 12 plans you discuss here are ensemble plans from the 13 set of ensemble plans we have already been 14 discussing, subject to the same parameters we have 15 already discussed.</p> <p>16 A. No. It's a new ensemble, but with the 17 same parameters. The difference is which districts 18 are being scrambled. In the statewide, in 6.1 all 19 seven districts are being scrambled and redrawn. In 20 6.2 the same principles are used, but only four of 21 the districts are being altered.</p> <p>22 Q. Got it. And those districts are 1, 2, 5 23 and 6. Is that right?</p> <p>24 A. That's correct.</p> <p>25 Q. And again, this Figure 11, the</p>	<p style="text-align: right;">Page 149</p> <p>1 BY MR. GORE:</p> <p>2 Q. Dr. Duchin, did you discuss your 3 testimony or deposition with anyone during the 4 break?</p> <p>5 A. I did not.</p> <p>6 Q. I want to ask one more question about 7 section 6 before I move on to section 7.</p> <p>8 A. Yes.</p> <p>9 Q. In section 6, back on page 22 you 10 identified some of the other principles that you 11 used to program the algorithm that generated the 12 ensemble map. And you noted a preference for 13 compactness and for the preservation of counties and 14 municipalities.</p> <p>15 A. Yes.</p> <p>16 Q. Does your report contain any analysis of 17 how the enacted plan compares to the ensemble plans 18 with respect to those criteria?</p> <p>19 A. No, it's not in my report, but it could 20 be derived from the outposts.</p> <p>21 Q. Thank you. All right. Let's move to 22 section 7. We talked a little bit about minority 23 opportunity during your deposition. Do you know how 24 counsel identified these races that are shown here 25 on page 25?</p>

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<p>1 A. My understanding is that they were 2 derived from the expert work of Baodong Liu who was 3 the Gingle -- let's just say the racially polarized 4 voting expert in the case. I suppose it's not 5 Gingles. So I think these come from Liu's RPV 6 analysis.</p> <p>7 Q. And you didn't conduct any independent 8 RPV analysis. Correct?</p> <p>9 A. I did not in South Carolina, although I 10 frequently do, and I understand the methodology 11 well.</p> <p>12 Q. And under Table 6 it says: "Black 13 candidates of choice were identified in a racially 14 polarized voting analysis provided by counsel." So 15 what is the racially polarized voting analysis that 16 counsel provided?</p> <p>17 A. I see. The wording in here might be a 18 little bit confusing. What I was provided with is 19 this list of four races. It is my understanding 20 that they were extracted from a racially polarized 21 voting analysis, but I did not read Baodong's 22 report.</p> <p>23 Q. And you didn't read any other racially 24 polarized voting analysis for this case -- or for 25 this report, anyway?</p>	<p>1 in saying that Table 7 shouldn't be interpreted as 2 democratic performance because it's the performance 3 of these four particular Democrats.</p> <p>4 Q. Certainly. And are these four 5 candidates the only Black candidates of choice in 6 South Carolina electoral history?</p> <p>7 A. No, they are not.</p> <p>8 Q. Okay. So you have four elections. And 9 you have identified -- or had identified for you 10 four Black candidates of choice. And in each of 11 those four elections those candidates are Democrats. 12 Right?</p> <p>13 A. Yes, these were four or five. I mean, 14 Joe Biden and Kamala Harris being on one ticket but 15 different people.</p> <p>16 Q. So maybe we will refer to them as 17 tickets, just to be precise. Table 7 records the 18 number of times any of these candidates won in each 19 district in each of the plans listed here. Correct?</p> <p>20 A. Right. And just to be perfectly clear, 21 one means that they had more votes than their major 22 party opponent, in this case a Republican. So it 23 does not take third-party votes into account. So 24 it's the plurality winner, essentially.</p> <p>25 Q. Thank you. And thank you for that</p>
<p style="text-align: right; padding-right: 10px;">Page 151</p> <p>1 A. I did not. I took these at face value 2 as the probative elections to consider.</p> <p>3 Q. And are any of these congressional 4 elections?</p> <p>5 A. No. These are all statewide elections, 6 which is important for an ensemble analysis.</p> <p>7 Q. And, generally, these would be exogenous 8 elections when analyzing congressional results. Is 9 that right?</p> <p>10 A. Correct. That term usually means they 11 are from a different contest. And these being 12 statewide races are exogenous for Congressional 13 analysis.</p> <p>14 Q. Was the Black candidate of choice in 15 each of these elections a Democrat?</p> <p>16 A. Yes, that's my understanding.</p> <p>17 Q. And so if we look down to Table 7, is 18 another way to look at your charts is how often the 19 democratic candidate won. Correct?</p> <p>20 A. Well, these democratic candidates. By 21 contrast, in Figure 12, I compared these candidates 22 to the other democratic candidates.</p> <p>23 Q. Certainly. We will go get to Figure 12. 24 For now I'm just asking about Table 7.</p> <p>25 A. Right. I was attempting to answer that</p>	<p style="text-align: right; padding-right: 10px;">Page 153</p> <p>1 clarification. So each of these quote/unquote wins 2 is the Black preferred candidate, who is also a 3 democrat, prevailing in the two-party vote. Is that 4 correct?</p> <p>5 A. That is correct.</p> <p>6 Q. So take the enacted plan, for example, 7 it lists four wins in District 6.</p> <p>8 A. Yes.</p> <p>9 Q. And each of those wins is for a Black 10 preferred candidate. Correct?</p> <p>11 A. Yes.</p> <p>12 Q. And each is also for a Democrat. 13 Correct?</p> <p>14 A. Yes.</p> <p>15 Q. And in your experience have you ever 16 seen a case or scenario where the Black preferred 17 candidate was not a democrat?</p> <p>18 A. I'm thinking. In a recent electoral 19 history in statewide elections, that is in elections 20 with a party ID, at the moment Black preferred 21 candidates do strongly tend to be Democrats 22 nationwide. That's not necessarily true for other 23 minority groups. Are there exceptions? Well, it is 24 definitely the case that ecological inference 25 methods, which are usually what underpin RPV</p>

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<p style="text-align: right;">Page 154</p> <p>1 analysis, show areas of the country in which Black 2 voters have preferred Republicans at times. But in 3 the studies that I personally have conducted I have 4 not seen that, at least with any frequency.</p> <p>5 Q. And so according to Table 7, enacted 6 2022 and previous 2012 which I have been calling the 7 benchmark plan, each have four wins in District 6. 8 Right?</p> <p>9 A. That's correct.</p> <p>10 Q. And I'm going to flip back to page 24 -- 11 23 and 24. You identified an alternative districts 12 plan here.</p> <p>13 A. Yes.</p> <p>14 Q. And do you know how many wins these 15 districts generated?</p> <p>16 A. I do. It's described in the footnote.</p> <p>17 Q. I see it. Okay.</p> <p>18 A. And the footnote says that the candidate 19 of choice won outright in one of the four contests 20 and received at least 47.5 percent of the vote; i.e. 21 they were in that 5 percent margin in the other 22 three.</p> <p>23 Q. So that would be a total of five wins. 24 Is that right?</p> <p>25 A. Out of four? No.</p>	<p style="text-align: right;">Page 156</p> <p>1 So, in other words, the fact that it strengthened is 2 because the percentages for the Black candidates of 3 choice are higher. That is the basis of the claim 4 that it strengthened. And the fact that -- sorry. 5 Which candidate would likely have to campaign in a 6 way that led to some Black support in order to 7 prevail, right. So I see that those high 8 percentages tell me the Black supporters have 9 considerable electoral influence, which is what 10 supports the statement that candidates would need 11 some Black support in order to prevail.</p> <p>12 Q. Do you know what the BVAP is in this 13 alternative CD 5?</p> <p>14 A. Good question. Let's see if I recorded 15 it. Yes. It seems to be 30.3 percent. I think 16 that is what -- yeah, I think that is the correct 17 way to understand the Figure -- the histogram in 18 Figure 11.</p> <p>19 Q. So a candidate could prevail in that 20 district without a single Black vote. Correct?</p> <p>21 A. A candidate -- theoretically, for sure. 22 But under the electoral numbers that I saw in the 23 election history, I consider that to be quite 24 unlikely.</p> <p>25 Q. Why did you consider that to be</p>
<p style="text-align: right;">Page 155</p> <p>1 Q. If we were to -- if that had been -- if 2 that plan had been listed here on Table 7, how many 3 wins would we be talking about?</p> <p>4 A. Yes, I agree, in this table that would 5 show up as a 5.</p> <p>6 Q. I was making an assumption, because I 7 believe in the alternative plan that we are talking 8 about District 6 is either identical or 9 substantially similar to enacted District 6. Is 10 that right?</p> <p>11 A. It's virtually identical.</p> <p>12 Q. Okay. So I was drawing the assumption 13 that that counted for four wins right there.</p> <p>14 A. Yes. You are correct.</p> <p>15 Q. And you say there is one more in 16 District 5, for a total of five.</p> <p>17 A. Agreed.</p> <p>18 Q. And I want to go back to that footnote 19 8, last sentence where you say: "That performance 20 corroborates the claim that this is a strengthened 21 district for Black voters, and one in which a 22 candidate would likely have to campaign in a way 23 that led to some Black support in order to prevail." 24 What analysis did you do to support this statement?</p> <p>25 A. It's supported by the previous sentence.</p>	<p style="text-align: right;">Page 157</p> <p>1 unlikely?</p> <p>2 A. Because the combination, as we keep 3 discussing, of the votes of Black voters and of the 4 crossover votes that align with Black voters is very 5 strong in this district.</p> <p>6 Q. I guess I'm confused. How does that 7 square with the statement that the -- or the 8 assumption that voting in these elections was 9 racially polarized?</p> <p>10 A. You mean how is it possible to have 11 racial polarization and also have crossover support 12 for Black candidates of choice? Is that the 13 question?</p> <p>14 Q. Sure.</p> <p>15 A. Oh, sure. For example, you could 16 imagine a scenario where 75 percent of non-Black 17 voters do not support the Black candidate of choice. 18 That would be considered racially polarized 19 frequently by standards that I have seen in court. 20 But that still leaves 25 percent of the non-Black 21 electorate that can cross over and align with the 22 candidate of choice. And depending on how you draw 23 your district, you might capture just such voters, 24 crossover voters. Does that answer your question?</p> <p>25 Q. Thank you. Yes.</p>

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<p>1 So back to footnote 8 on page 23, other 2 than looking at the results of these four elections, 3 did you do any analysis to determine whether a 4 candidate would likely have to campaign in a way 5 that led to some Black support in order to prevail?</p> <p>6 A. I'm sorry. I didn't mean to give you 7 the impression that there was any additional 8 analysis. That last sentence is my interpretation 9 of the consequence of the previous sentence. I 10 don't represent any further research supporting 11 that.</p> <p>12 Q. Thank you. All right. Let's go back 13 then to Table 7.</p> <p>14 A. Yes.</p> <p>15 Q. Do you happen to know what percentage 16 the vote -- the Black preferred candidate receives 17 in other districts in the enacted plan outside of 18 District 6?</p> <p>19 A. I don't have those numbers in front of 20 me. I did look at those when I was doing the 21 analysis that led to writing this section, but I 22 don't have those numbers in front of me.</p> <p>23 Q. And correct me if I'm wrong, but I don't 24 believe those numbers are in your report.</p> <p>25 A. No. That's correct, they are not.</p>	<p>1 there is significant crossover voting in that 2 district. Correct?</p> <p>3 A. Yes.</p> <p>4 Q. So to get to a plurality, would the 5 Black preferred candidate need more votes from White 6 voters than that candidate receives from Black 7 voters?</p> <p>8 A. It depends on who votes. It doesn't 9 follow from these numbers.</p> <p>10 Q. But it is possible, right, depending on 11 turnout and electoral behavior and things like that?</p> <p>12 A. It's possible. I mean, turnout is far 13 from 100 percent of voting age population, so many 14 things are possible. It's hard to say who turns 15 out. It's a general problem facing election 16 analysis.</p> <p>17 Q. And can turnout vary by race?</p> <p>18 A. Yes, it can. There is an excellent book 19 on that by Bernard Fraga, F-R-A-G-A.</p> <p>20 Q. And this District 1 with 21.2 percent 21 BVAP, that's not the second highest BVAP district in 22 the Harpoottlian plan we discussed in section 6.</p> <p>23 Right?</p> <p>24 A. That's right. It looks like District 5 25 is the second highest.</p>
<p style="text-align: right; padding-right: 10px;">Page 159</p> <p>1 Q. All right. So let's look at this. So 2 the Harpoottlian plan in District 1 generates two 3 wins for the Black preferred candidate. Is that 4 right?</p> <p>5 A. That's right.</p> <p>6 Q. Who also happens to be a Democrat. Is 7 that right?</p> <p>8 A. Yes. And these Black preferred 9 candidates are all Democrats.</p> <p>10 Q. I want to go back to page -- and then 11 the Harpoottlian plan does not generate any other 12 wins for Black preferred candidates in any other 13 districts. Correct?</p> <p>14 A. That's right. Although, again, this 15 table doesn't show you instances of getting close 16 but it just shows you whether you cross the line to 17 having plurality support. You're right. There are 18 no other instances of plurality support.</p> <p>19 Q. So let's go back to page 9, if we might.</p> <p>20 A. We might.</p> <p>21 Q. And in the Harpoottlian plan, what is the 22 BVAP of District 1?</p> <p>23 A. 21.2 percent.</p> <p>24 Q. So for the Black preferred candidate to 25 prevail in a 21.2 percent BVAP district, that means</p>	<p style="text-align: right; padding-right: 10px;">Page 161</p> <p>1 Q. And 21.2 percent BVAP district in 2 District 1 in the Harpoottlian plan also has a lower 3 BVAP than the second highest BVAP district in the 4 enacted plan. Right?</p> <p>5 A. Sorry. Let me unpack that. You're 6 asking if the 21.2 is higher -- is lower than the 7 second higher.</p> <p>8 Q. Yes. Is 21.2 lower than 25.4?</p> <p>9 A. Definitely. I do answer that.</p> <p>10 Q. That will make it easier. Sorry. It's 11 hard to describe some of this shorthand.</p> <p>12 A. Yes.</p> <p>13 Q. And so according to Table 7, the 14 Harpoottlian plan performs for the minority preferred 15 candidate in District 1 with 21.2 percent BVAP, but 16 not in District 5 with 33.7 percent BVAP. Is that 17 right?</p> <p>18 A. Well, let's be clear. The term 19 "performs" is not 100 percent clear, or I don't 20 think is language that I use, but of these Black 21 candidates of choice there are two wins in District 22 1 in the Harpoottlian plan and no wins in District 5, 23 despite the fact that 5 has higher BVAP. I think 24 that was the essence of the question. Right?</p> <p>25 Q. That is the essence of the question. So</p>

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<p style="text-align: right;">Page 162</p> <p>1 District 5 has maybe 12-and-a-half-percent higher 2 BVAP than District 1. And in District 5 there are 3 zero wins for those four candidates and in District 4 1 there are two wins for those four candidates. 5 Right?</p> <p>6 A. Right. I think this completely supports 7 the point discussed earlier, that BVAP is an 8 imperfect proxy for electoral opportunity.</p> <p>9 Q. And does it also support the point that 10 what is driving wins for Black preferred candidates 11 is the presence or absence of White crossover 12 voting?</p> <p>13 A. I wouldn't say that drives. I would say 14 it contributes.</p> <p>15 Q. And you would say that it's a 16 significant factor. Right?</p> <p>17 A. That White crossover voting is a 18 significant factor in outcomes?</p> <p>19 Q. Yes.</p> <p>20 A. No question, yes, it certainly is.</p> <p>21 Q. And how significant a factor is it?</p> <p>22 A. Could you maybe rephrase the question?</p> <p>23 Q. Probably not. That was my 24 characterization, significant factor. And so maybe 25 we can just leave it at that --</p>	<p style="text-align: right;">Page 164</p> <p>1 directed at that question before I would feel 2 comfortable characterizing the geography of 3 crossover support.</p> <p>4 Q. And you have identified Charleston and 5 Columbia as places where there is significant 6 crossover support in South Carolina. Correct?</p> <p>7 A. I have noticed those trends in those 8 areas, but again, I did not do, you know, a primary 9 analysis to address that question and so I want to 10 be careful not to overstate.</p> <p>11 Q. And thank you for that clarification.</p> <p>12 In addition to Charleston and Columbia 13 are there any others that come to mind?</p> <p>14 A. No, there aren't, but the fact that 15 nothing comes to mind shouldn't be taken to say that 16 there aren't other areas. I just didn't put primary 17 attention towards that question.</p> <p>18 Q. Let's return to page --</p> <p>19 A. Table 7.</p> <p>20 Q. It's page 25. Can you see it on my 21 screen, by the way?</p> <p>22 A. Yes, I can.</p> <p>23 Q. Make sure that's clear for the record. So let's look at the League of Women 24 Voters plan which is right below the Harpoon plan</p>
<p style="text-align: right;">Page 163</p> <p>1 A. I agree with significant factor.</p> <p>2 Q. -- that you agree with the significant 3 factor.</p> <p>4 A. (Witness nods head).</p> <p>5 Q. And do you happen to know where, in 6 South Carolina, White Democrats live?</p> <p>7 A. Well, first I would say that I resist 8 characterizing people -- people as either Democrats 9 or Republicans because, for example, I live in a 10 state where people vote one way for Senate and 11 wildly differently for governor. And so party 12 affiliations are not immutable. But I have looked 13 at where, in the State, it's possible to find 14 historically effective districts, in the sense that 15 I discuss here in section 7, that are affected 16 despite a relatively low BVAP. I have seen places 17 in the State, especially near Charleston and 18 Columbia, where there are significant historical 19 levels of crossover support.</p> <p>20 Q. And is it accurate to say, at least in 21 South Carolina, that those areas of crossover 22 support and crossover opportunity are concentrated 23 in particular areas of the State, as opposed to 24 being diffused evenly across the state?</p> <p>25 A. I would really have to do an analysis</p>	<p style="text-align: right;">Page 165</p> <p>1 plan.</p> <p>2 A. Yes.</p> <p>3 Q. It has an effectiveness total of 6, 4 which includes two wins in District 1, four wins in 5 District 6 and no wins in any other district. Is 6 that right?</p> <p>7 A. That's right.</p> <p>8 Q. And so if we return to page 9 and look 9 at the BVAP in the LWV districts, it looks like it's 10 23.3 percent in District 1.</p> <p>11 A. Agreed.</p> <p>12 Q. And that's lower than the 24.4 in 13 District 5 and the 24.5 in District 7. Correct?</p> <p>14 A. That's right.</p> <p>15 Q. And so in the LWV plan, District 1 is 16 not the second highest BVAP district. Is that 17 right?</p> <p>18 A. That's right.</p> <p>19 Q. And the 23.3 percent is also lower than 20 the 25.4 percent in enacted 2 and 7. Correct?</p> <p>21 A. Again? Sorry.</p> <p>22 Q. No problem. The 23.3 percent BVAP in 23 LWV District 1 is lower than the 25.4 percent BVAP 24 in enacted 2 and enacted 7. Correct?</p> <p>25 A. That's correct.</p>

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<p style="text-align: right;">Page 166</p> <p>1 Q. And then if we return to page 25, let's 2 look at the SC-NAACP2 plan. It has effectiveness of 3 eight out of 28. Four wins in District 1, two in -- 4 I'm sorry. And four in District 6. Sorry. I 5 started reading the wrong line.</p> <p>6 A. That's all right.</p> <p>7 Q. And none in any other district.</p> <p>8 A. Correct.</p> <p>9 Q. And if we go back to page 9, the BVAP in 10 SC-NAACP2, District 1, is 24 percent.</p> <p>11 A. It is.</p> <p>12 Q. And that's lower than 25.4 percent in 13 District 7.</p> <p>14 A. Yes.</p> <p>15 Q. So it's also not the second-highest BVAP 16 district in that plan.</p> <p>17 A. That's right. Would it be okay to 18 summarize and say that it's frequently the case that 19 District 1 performs well in effectiveness despite a 20 lower BVAP than other nonperforming districts?</p> <p>21 Q. Yes, that would be fair. And my 22 follow-up question is in Charleston -- and is that 23 because of portions of Charleston that are included 24 in District 1 where there is crossover voting?</p> <p>25 A. It's possible that those phenomena are</p>	<p style="text-align: right;">Page 168</p> <p>1 to stand alone as explanatory of performance. And I 2 always, in my ratings, resist using BVAP alone as a 3 proxy for performance. This is why I like to use 4 electoral history. But it is a piece of the puzzle. 5 A high BVAP correlates well with the 6 presence of opportunity in areas with especially 7 high polarization, and so targeting a depressed BVAP 8 in Districts 7 and 2 relative to the neutral 9 baseline is ensuring a reduced electoral opportunity 10 in those areas. Now, let me be clear, there are 11 parts of the State, as we have just reviewed, where 12 you can overperform your BVAP. But I haven't seen 13 evidence that it's possible in the parts of the 14 State touched by, for example, District 2 to find a 15 creative configuration that would allow 25 percent 16 BVAP to coexist with meaningful electoral 17 opportunity. 18 So let me summarize all of what I just 19 said. Hitting a certain target level for BVAP is 20 neither necessary nor sufficient for electoral 21 opportunity. You have to do both kinds of analysis. 22 But looking at BVAP targeting can give us strong 23 evidence of racial predominance over other 24 considerations, and that's why I offer that as an 25 element of the analysis but not one that is meant to</p>
<p style="text-align: right;">Page 167</p> <p>1 localized to Charleston. But what is clear is that, 2 overall, the district contains a population that due 3 to its voting behavior and including turnout it 4 overperforms what you might have supposed from its 5 BVAP alone.</p> <p>6 Q. When you were analyzing cracking and 7 vote dilution in section 6 of your report, you 8 focused on the second highest BVAP district. 9 Correct?</p> <p>10 A. That's right.</p> <p>11 Q. And in the Harpoolian, LWV and 12 SC-NAACP2 plans here in Table 7, the district that 13 you determine is effective is not the second highest 14 BVAP plan. Correct?</p> <p>15 A. Absolutely agreed.</p> <p>16 Q. So what does section 6 tell us about 17 vote dilution?</p> <p>18 A. Good. Well, I'm glad you asked. So I 19 think what it tells us is about what is being 20 constructed across the districts around the state 21 and so, in particular, as we understand well, from 22 our study of voting patterns, there are some areas 23 with higher crossover support and some areas with 24 lower crossover support. You would never -- I think 25 a reasonable practitioner would never expect a BVAP</p>	<p style="text-align: right;">Page 169</p> <p>1 be taken in a vacuum of electoral history. 2 Q. Thank you for that explanation. 3 Let's take enacted District 1 as an 4 example. So enacted District 1 does not perform for 5 the Black candidate of choice. Is that correct? Or 6 it doesn't result in any wins for the Black 7 candidate of choice in those four elections. 8 Correct? 9 A. That's right. 10 Q. And so that means it also doesn't result 11 in any wins for the crossover voters' candidate of 12 choice. Correct? 13 A. The crossover voters' candidate of 14 choice, that's not a construction that I have heard, 15 but I think what you mean by that is there are, 16 let's say, White voters who support the Black 17 candidate of choice and they also do not see their 18 chosen candidate prevail. Is that -- 19 Q. That's exactly what I mean. 20 A. True. 21 Q. And, in fact, in enacted District 1, for 22 voters who voted for the democratic candidate, their 23 candidate of choice is not winning either. Right? 24 A. So I think -- let me try to separate out 25 the phrase "candidate of choice" because that is a</p>

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<p>1 little bit of a term of art, as I understand it, at 2 least in my areas of expertise. So "candidate of 3 choice" is the overall preference of a racial, 4 ethnic or language group. I don't think it just 5 means the candidate that you voted for. Right? And 6 so White voters' candidate of choice in South 7 Carolina is, to my understanding, always the 8 Republican in a party ID contest. But having said 9 that, just to set out the terms of discussion, 10 you're asking, I think, if White voters who voted 11 for the Democrat can prevail in a district in which 12 the Republican always wins. Am I understanding --</p> <p>13 Q. Go ahead and answer that. Yeah.</p> <p>14 A. If you're a White voter who voted for a 15 Democrat but your district always goes Republican, 16 then your favorite candidate is not being elected.</p> <p>17 Q. And so the way you describe that is the 18 candidate of choice or candidate for whom they 19 voted, that candidate is not prevailing.</p> <p>20 A. Right. Any voter who voted for a 21 Democrat is not seeing their preferred candidate 22 elected in a district that always elects 23 Republicans.</p> <p>24 Q. And that's true, regardless of the race 25 of that voter. Correct?</p>	<p>1 instances in which the Democratic candidate won. Is 2 that right?</p> <p>3 A. Yes.</p> <p>4 Q. And if we go to page 27, it looks like 5 these elections are listed on page 27.</p> <p>6 A. Let's see.</p> <p>7 Q. In the second full paragraph which 8 starts "This finding"?</p> <p>9 A. That's right. Seven more general 10 elections are evaluated, and I list them.</p> <p>11 Q. And do you know whether racially 12 polarized voting was present in any of those 13 elections?</p> <p>14 A. I don't know. I have not read any 15 report on that matter, but I think it is general 16 common knowledge that statewide elections in the 17 last ten years in South Carolina tend to be racially 18 polarized.</p> <p>19 Q. And if we go back to the bottom 20 histogram of Figure 12, it looks like both the 21 previous and the enacted plans perform -- or 22 generate eight wins for the Democrats. Is that 23 right?</p> <p>24 A. That's right.</p> <p>25 Q. And it's ten in the Harpoonian and LWV</p>
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<p>1 A. That has nothing to do with the race of 2 the voter. I agree.</p> <p>3 Q. Let's move to page 26, Figure 12. And 4 it looks like this top chart in 12 -- or this top 5 histogram, to be more precise, is a histogram of 6 Table 7. Is that right?</p> <p>7 A. That's right. It shows, I hope, if I 8 don't have any typos, the numbers that you see in 9 the key should match the total effectiveness numbers 10 in the table.</p> <p>11 Q. And this bottom chart is a histogram 12 that shows other Democratic -- outcomes for other 13 Democratic candidates in 63 other races. Is that 14 right?</p> <p>15 A. It is --</p> <p>16 Q. Or perhaps it's nine races disaggregated 17 over or reconstituted over seven districts.</p> <p>18 A. We were just rushing to agree with each 19 other. It is nine contests times seven districts.</p> <p>20 Q. So this is nine statewide races.</p> <p>21 A. Correct.</p> <p>22 Q. Reconstituted in the seven districts in 23 each of the plans.</p> <p>24 A. That's right.</p> <p>25 Q. And the total numbers are the number of</p>	<p>1 plans. Is that right?</p> <p>2 A. Yes.</p> <p>3 Q. As well as NAACP2?</p> <p>4 A. Yes.</p> <p>5 Q. So I'm hoping, Doctor, as a 6 mathematician you can help me do a little math here 7 in Figure 12.</p> <p>8 A. Here is hoping.</p> <p>9 Q. Can you entertain me on that? At least 10 indulge me on that for a moment? So it looks like 11 in this top histogram the enacted plan generates 4 12 wins out of 28 races.</p> <p>13 A. Yes.</p> <p>14 Q. Do you know what percentage 4 out of 28 15 is? Or can you calculate that?</p> <p>16 A. 7, I think, is about 14 percent.</p> <p>17 Q. And in this bottom chart it's 8 out of 18 63.</p> <p>19 A. Right.</p> <p>20 Q. And do you know what that percentage is?</p> <p>21 A. Well, let's see. 8 out 64 would be an 22 eighth, which is 12 and a half percent, so close to 23 that.</p> <p>24 Q. So the enacted plan generates wins about 25 14 percent of the time for the Black preferred</p>

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<p style="text-align: right;">Page 174</p> <p>1 candidate in the races you examined, and about 12 2 and a half percent of the time, maybe 13 percent of 3 the time for the Democratic candidate in the races 4 you examined. Is that right?</p> <p>5 A. Well, as you have repeatedly noted, the 6 probative elections, those are also Democrats. So 7 the 12.5 is for the other Democrats, not for -- it's 8 not the union of them all. It's the complement of 9 them.</p> <p>10 Q. Thank you. For now I'm just trying to 11 compare these two histograms.</p> <p>12 A. Yes.</p> <p>13 Q. So the four elections that were 14 identified to you as having racially polarized 15 voting with a Black candidate of choice are in the 16 top histogram.</p> <p>17 A. That's correct.</p> <p>18 Q. And the enacted plan generates wins for 19 that candidate around 14 percent of the time, is 20 that correct, because it 4 out of 28?</p> <p>21 A. The only thing I might quibble with is 22 the word "generate," but yes --</p> <p>23 Q. Results in.</p> <p>24 A. That's right.</p> <p>25 Q. Yeah, it's a better term of art. Maybe</p>	<p style="text-align: right;">Page 176</p> <p>1 A. Yeah. I would only just remind us all 2 that wins are a function of two inputs, the votes 3 and the plan. Not the plan alone, not the votes 4 alone, but the combination of the votes and the 5 plan. So yes, the four candidates have a higher 6 percentage of wins. They also have a higher 7 percentage of votes.</p> <p>8 Q. All right. Let's turn to page 27. I 9 just want to make sure I understand some of the 10 phrasing that's being used here.</p> <p>11 A. Sure.</p> <p>12 Q. The third sentence says: "Only 12.4 13 percent of maps drawn in a race-neutral fashion, top 14 of Figure 12, have as low an effectiveness score as 15 the state's plan."</p> <p>16 A. Yes.</p> <p>17 Q. What are being referred to as the maps 18 drawn in a race-neutral fashion?</p> <p>19 A. That's the ensemble, which I'm just 20 reminding the reader was drawn in a race-neutral 21 fashion.</p> <p>22 Q. And drawn subject to the other 23 considerations and parameters you set in the 24 algorithm. Right?</p> <p>25 A. Yes.</p>
<p style="text-align: right;">Page 175</p> <p>1 we will use "results."</p> <p>2 And then for this second histogram, 3 which is 63 other races -- well, it's nine other 4 races over seven districts, the enacted plan results 5 in wins for the Democratic candidate about 12 and a 6 half or 13 percent of the time. Is that correct?</p> <p>7 A. Yes.</p> <p>8 Q. So the enacted plan results in wins for 9 the Black candidate of choice more frequently in 10 that first histogram than for the Democratic 11 candidate in the second histogram. Correct?</p> <p>12 A. Well, let's be clear. The four 13 candidates fared better statewide than the 14 counterparts in the second histogram. So their vote 15 pole, statewide, was considerably higher. So it's 16 not surprising at all. But actually, I suppose I 17 should let you get to the question. So it's true 18 that the percentage is higher in the first set. And 19 then was there a question about that?</p> <p>20 Q. I was trying to get a yes or no, but I 21 think you gave it to me. So you agree the 22 percentage is higher.</p> <p>23 A. I do.</p> <p>24 Q. Percentage of wins -- resulting wins is 25 higher in the first set than in the second set?</p>	<p style="text-align: right;">Page 177</p> <p>1 Q. And then you say something about -- 2 starting with the sentence that starts: "This 3 shows" -- "This shows many alternatives that were 4 available to the legislature will tend to allow 5 Black voters an opportunity to elect candidates of 6 choice at a level in keeping with the human and 7 political geography of the state." And my question 8 is, what is the human and political geography of the 9 state being referenced here?</p> <p>10 A. Oh, sure. First, though, because you 11 just read much of that paragraph but skipped a few 12 things, so if you don't mind, I will take a moment 13 to just read it through.</p> <p>14 Q. Yes, please.</p> <p>15 A. So I what I wrote is: "Only 12.4 16 percent of maps drawn in a race-neutral fashion, 17 parentheses, top of Figure 12, have as low an 18 effectiveness score as the state's plan when 19 considering the probative elections. By far the 20 most common outcome for these blindly drawn maps is 21 six wins for the Black candidate of choice, with 22 another significant spike at eight. This shows that 23 many alternatives" -- and I will add, outside of the 24 voice of the report, this is many thousands of 25 alternatives, "that were available to the</p>

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<p style="text-align: right;">Page 178</p> <p>1 legislature from the NAACP options to the LWV map to 2 the compromise plan represented by the Harpoonian 3 amendment will tend to allow Black voters an 4 opportunity to elect candidates of choice at a level 5 in keeping with the human and political geography of 6 the state."</p> <p>7 Okay. So what is meant by that? So 8 "human geography" is a phrase that means demographic 9 distribution. That's what human geography means. 10 It means where people live and which people live in 11 which locations. That's human geography.</p> <p>12 Political geography is the distribution 13 of votes. It's how people cast votes and in 14 correspondence with where they live. So the reason 15 that phrase is being used here is that the function 16 of an ensemble analysis is to take us away from 17 abstract notions like proportionality and have us 18 focus on what districts tend to produce under the 19 realistic geographic conditions of who lives where. 20 So it is often said, by me and others, that 21 ensembles are powerful because they hold constant 22 the human geography. All ensembles are drawn 23 against the same human geography and the old 24 constant -- the political geography, all ensembles 25 operate against the same pattern of votes.</p>	<p style="text-align: right;">Page 180</p> <p>1 Q. That's fine. I was just trying to get 2 the basis of the statement. And if there is any 3 other analysis -- is there any other analysis that 4 forms the basis of that statement?</p> <p>5 A. I would say that the statement is 6 primarily justified by those two factors, 7 traditional principles as they were measured in the 8 metrics and the electoral outcomes as featured in 9 the Figure 12.</p> <p>10 Q. So for this sentence is there -- are you 11 offering any support or opinion in support of this 12 statement other than the analysis that's in your 13 reports?</p> <p>14 A. No. It's only the analysis that's in 15 the report.</p> <p>16 Q. And you say that the maps from ten years 17 ago and again this year submerged traditional 18 principles in order to secure this outcome?</p> <p>19 A. I do.</p> <p>20 Q. Can you tell me which traditional 21 principles they submerge?</p> <p>22 A. Sure. If we go back to section 4, the 23 metrics section, I think that, arguably, compactness 24 is sacrificed, political subdivisions are higher 25 than they would be if they were being prioritized</p>
<p style="text-align: right;">Page 179</p> <p>1 So when I say here: "A level in keeping 2 with the human and political geography of the 3 state," what I mean is that the human-drawn maps and 4 the computer-drawn maps are assessed against the 5 same pattern of residential and political 6 distribution.</p> <p>7 Q. The next sentence says: "The state's 8 maps from ten years ago and again from this year are 9 the ones that are demonstrably diluted, and as we 10 have seen, they submerge traditional principles in 11 order to secure this outcome."</p> <p>12 A. Correct.</p> <p>13 Q. What analysis did you do on the State's 14 maps from ten years ago?</p> <p>15 A. I think it's featured throughout the 16 report, probably in a dozen or more places. Should 17 we go through and itemize them? That's a sincere 18 question. Tell me what you mean. It's featured 19 throughout the review of metrics, for example, which 20 is what I'm using to talk about traditional 21 principles, and it's featured in the comparisons 22 that immediately precede that conclusion; namely, 23 it's featured in Figure 12, looking at the 24 effectiveness and probative and other Democratic 25 elections. So that's the basis of the statement.</p>	<p style="text-align: right;">Page 181</p> <p>1 more. So that includes city splits, town splits, 2 subdivision splits, county splits. And all of the 3 more qualitative features that are discussed in 4 section 5, with respect to the enacted plan which 5 have to do with when you split something, how do you 6 split it, those are also at issue.</p> <p>7 Q. And all those traditional principles 8 involve tradeoffs with other principles, as we 9 discussed before. Correct?</p> <p>10 A. Always.</p> <p>11 Q. So if we go back to page 27 --</p> <p>12 A. Yes.</p> <p>13 Q. -- how is it that you conclude that a 14 certain performance on traditional principles was 15 done in order to secure the dilution of Black votes 16 or Black voting strength?</p> <p>17 A. In other words, just to be sure I 18 understand the question, you're asking could it be a 19 coincidence that the traditional principles -- that 20 the metrics are worse on traditional principles? Is 21 that the question?</p> <p>22 Q. Well, I guess I'm asking -- you said 23 that the -- you pointed to the metrics on additional 24 principles and said they are worse in the enacted 25 plan than in other plans.</p>

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<p style="text-align: right;">Page 182</p> <p>1 A. Yes.</p> <p>2 Q. At least with respect to certain</p> <p>3 metrics.</p> <p>4 A. That's right.</p> <p>5 Q. And then I read this sentence to be</p> <p>6 drawing a straight line between that relative</p> <p>7 performance on those metrics and a conclusion that</p> <p>8 that relative performance was undertaken for the</p> <p>9 purpose of securing the outcome of diluting Black</p> <p>10 voting strength. Have I read the sentence</p> <p>11 correctly?</p> <p>12 A. I think I understand what you're asking.</p> <p>13 So I would say I don't tend to make conclusions like</p> <p>14 that based on metrics alone. I try to always do a</p> <p>15 multifactorial analysis. And in this case there</p> <p>16 are -- all the tools that I have used here kind of</p> <p>17 point in this way. So there are quantitative tools</p> <p>18 in the metrics section, there are qualitative tools</p> <p>19 in the detailed district review. There is a look at</p> <p>20 BVAP. There is a look at electoral performance.</p> <p>21 These are many different kinds of evidence. And</p> <p>22 you're absolutely right that in an analysis like</p> <p>23 this you can't rule out the presence of other</p> <p>24 reasons. That is very difficult to do, in general.</p> <p>25 All you can do, as I emphasized early on, is to</p>	<p style="text-align: right;">Page 184</p> <p>1 conclusion.</p> <p>2 Q. Going down to Section 8, the</p> <p>3 "Conclusion," I think we have covered most of this</p> <p>4 ground but I just want to confirm my understanding,</p> <p>5 the first sentence of section 8 says: "By comparing</p> <p>6 various plans for South Carolina Congressional</p> <p>7 districting, I find that the state's plan</p> <p>8 Enacted2022 expressly contravenes the legislature's</p> <p>9 own Guidelines, which clearly state" -- and then</p> <p>10 there is a quote which I won't read, for the benefit</p> <p>11 of the court reporter. Am I reading the sentence</p> <p>12 correctly, if I understand, that the express</p> <p>13 contravention of the legislature's own guidelines is</p> <p>14 its contravention, in your judgment, of what's</p> <p>15 quoted here, which is about minority voting</p> <p>16 strength?</p> <p>17 A. That's right. And with apologies to the</p> <p>18 court reporter, just to refresh my memory of my own</p> <p>19 claim here, that quote is: "Any proposed</p> <p>20 redistricting plan that is demonstrated to have the</p> <p>21 intent or effect of dispersing or concentrating</p> <p>22 minority population in a manner that prevents</p> <p>23 minorities from electing their candidates of choice</p> <p>24 will be neither accepted nor approved." I do feel</p> <p>25 that that is expressly contravened by the choice of</p>
<p style="text-align: right;">Page 183</p> <p>1 marshal evidence in support of a conclusion like</p> <p>2 this.</p> <p>3 So I suppose better phrasing might be to</p> <p>4 say that they submerge traditional principles as</p> <p>5 though in order to secure this outcome. Right?</p> <p>6 What I'm trying to get at is I cannot be sure of all</p> <p>7 the reasons in play. All I can know is what's in</p> <p>8 the public record. But I find no countervailing</p> <p>9 explanation in the public record that leads me to</p> <p>10 doubt the causal relationship that I'm describing</p> <p>11 here.</p> <p>12 Q. And what do you mean by "the public</p> <p>13 record"?</p> <p>14 A. I mean I have described what I examined</p> <p>15 and it included all the voluminous public testimony,</p> <p>16 it included published guidelines issued by both the</p> <p>17 House and the Senate. And I have not seen</p> <p>18 explanations in that public record. You're right,</p> <p>19 that I should be careful, "public record" could mean</p> <p>20 any number of things. And I have already conceded</p> <p>21 that I did not review all of the legislative record.</p> <p>22 But the record that I did review, which included the</p> <p>23 State's Guidelines in two forms and the public</p> <p>24 testimony as well as my knowledge of the ways that</p> <p>25 these criteria tend to interact, lead me to this</p>	<p style="text-align: right;">Page 185</p> <p>1 plan among the options that were before the State.</p> <p>2 Q. And is it an intent violation?</p> <p>3 A. Happily, for me, the quote allows for</p> <p>4 intent or effect. Now, the use of ensembles has</p> <p>5 repeatedly been found to be helpful in discerning</p> <p>6 likely intent, but it's only evidence. It's not</p> <p>7 conclusive. But I find it to be strong evidence.</p> <p>8 And the effect, I think, is also clear from this</p> <p>9 kind of evidence. But the effect is to be</p> <p>10 uncommonly ineffective, especially in those most</p> <p>11 probative elections.</p> <p>12 Q. So in your opinion that is being</p> <p>13 conveyed in this sentence, does the plan, in your</p> <p>14 view, violate the Guidelines because of intent or</p> <p>15 because of effect?</p> <p>16 MS. ADEN: Objection.</p> <p>17 THE WITNESS: Let me try to answer that.</p> <p>18 I think I wrote that in a spirit -- and I continue</p> <p>19 to support a spirit that's agnostic to intent or</p> <p>20 effect. I think there is evidence of intent. I</p> <p>21 think there is evidence of effect. I think that,</p> <p>22 collectively, intent or effect has been</p> <p>23 well-supported by this evidence.</p> <p>24 BY MR. GORE:</p> <p>25 Q. But you don't have an opinion either</p>

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<p>1 way, whether it's intent or effect. Is that right?</p> <p>2 MS. ADEN: Objection.</p> <p>3 THE WITNESS: I again -- and I'm not</p> <p>4 trying to slip out of the question but just trying</p> <p>5 to be precise about my position, I feel I have</p> <p>6 provided evidence for both intent and effect. And I</p> <p>7 leave it to others to measure the strength of that</p> <p>8 evidence against their standards for intent and</p> <p>9 effect.</p> <p>10 BY MR. GORE:</p> <p>11 Q. So I'm just trying to understand this</p> <p>12 sentence. And the sentence doesn't say that you</p> <p>13 found evidence. It says that you found that the</p> <p>14 enacted plan expressly contravenes the Guidelines.</p> <p>15 A. Right.</p> <p>16 Q. And I'm just trying to understand what</p> <p>17 you meant by that. Is there more you can help me</p> <p>18 with there?</p> <p>19 A. Sure. I can try. So I'm a</p> <p>20 mathematician. I'm a data scientist. And so my</p> <p>21 findings -- especially in a report like this, but</p> <p>22 many of my writings, more generally, have to do with</p> <p>23 evidence. So I try not to make findings that are</p> <p>24 rooted only in sentiment, but to make findings that</p> <p>25 are rooted in evidence. And so when I say "I find,"</p>	<p>1 sets of Guidelines, that concerns like communities</p> <p>2 of interest, district cores and so on should be</p> <p>3 considered but cannot outweigh the protection of</p> <p>4 minority electoral opportunity. So this sentence is</p> <p>5 succinct, but I feel that its gist is supported</p> <p>6 throughout the Guidelines on both sides.</p> <p>7 Q. Thank you for that. What I'm trying to</p> <p>8 understand is, are there other considerations in the</p> <p>9 Guidelines, whether it was compactness or anything</p> <p>10 else, that you think the enacted plan expressly</p> <p>11 contravenes?</p> <p>12 A. Well, the full complement of principles,</p> <p>13 as we have noted repeatedly, they function as a</p> <p>14 balancing act. And so part of the evidence has to</p> <p>15 be, and what I hope I have expressed throughout this</p> <p>16 report, I have looked to the other principles as</p> <p>17 possible explanatory factors. That is, if the State</p> <p>18 were truly optimizing its compactness, if it were</p> <p>19 making its compactness just as good as possible, if</p> <p>20 that were top of mind, that might drive other</p> <p>21 metrics to suffer. That does not seem to be the</p> <p>22 case. So it is a holistic assessment, I want to</p> <p>23 insist, that has to do with trying to use the full</p> <p>24 spectrum of tools to analyze that balancing act.</p> <p>25 And I have failed to find an aspect that was fully</p>
<p>1 we can take that to be shorthand for I have</p> <p>2 satisfied myself that there is strong evidence.</p> <p>3 Q. And have you satisfied that there is</p> <p>4 strong evidence that the enacted plan has the intent</p> <p>5 of dispersing minority population?</p> <p>6 A. I do think there is evidence of an</p> <p>7 intent here.</p> <p>8 Q. And do you think that there is evidence</p> <p>9 that the enacted plan has the effect of dispersing</p> <p>10 minority population?</p> <p>11 A. Yes. I think -- once again, just at the</p> <p>12 risk of repetition, I think there is evidence of</p> <p>13 intent and evidence of effect.</p> <p>14 Q. And the next sentence says:</p> <p>15 "Considering" -- I'm sorry. One last question on</p> <p>16 this sentence.</p> <p>17 A. Sure.</p> <p>18 Q. When you say that the enacted plan</p> <p>19 expressly contravenes the legislature's own</p> <p>20 Guidelines, were there other aspects or</p> <p>21 considerations in the Guidelines that the enacted</p> <p>22 plan, in your judgment, expressly contravenes, or is</p> <p>23 it only what's quote here?</p> <p>24 A. Well, the full context of the</p> <p>25 Guidelines, I feel, repeats over and over in both</p>	<p>1 explanatory of all the small and large choices that</p> <p>2 I saw that end with the effect of dispersing</p> <p>3 minority population in a manner that prevents</p> <p>4 minorities from electing their candidates of choice.</p> <p>5 So I think this is responsive. And I'm trying to be</p> <p>6 succinct. It's really the guideline documents as a</p> <p>7 whole. But this sentence goes very far to explain.</p> <p>8 It's pointing to the clearest spirit of the</p> <p>9 Guidelines that I think is not upheld by the plans.</p> <p>10 Q. I think the next sentence says:</p> <p>11 "Considering this strong guidance, and the increased</p> <p>12 Black population in the Columbia and Charleston</p> <p>13 areas, we would expect increased electoral</p> <p>14 opportunities for Black voters to be reflected in</p> <p>15 the Congressional plan." Why would we expect that?</p> <p>16 A. What this means is if someone were to</p> <p>17 follow the spirit of the quoted sentence, their</p> <p>18 opportunity to create effective districts has</p> <p>19 probably only gone up. The ability to create</p> <p>20 effective electoral opportunity for Black voters has</p> <p>21 probably only increased since ten years ago because</p> <p>22 of the increased Black population in key areas. So</p> <p>23 since -- what this sentence means to say is that</p> <p>24 since the Guidelines tell us that we should not</p> <p>25 prevent minorities from electing their candidates of</p>

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<p style="text-align: right;">Page 190</p> <p>1 choice and since the opportunity is there, then we 2 would expect to see someone following the guidelines 3 to present the plan with increased electoral 4 opportunities over the plan from ten years ago.</p> <p>5 Q. And you said that the General Assembly 6 would have had the ability to increase Black voting 7 opportunity. Did it have an obligation to do so, in 8 your opinion?</p> <p>9 A. That's a good question. That's maybe 10 more of a legal question than one that I am 11 attempting to address in this report. Did they have 12 the obligation? The Guidelines seem to provide -- I 13 don't think you would call it an obligation, but an 14 imperative, a mention, a goal.</p> <p>15 So the Guidelines express that minority 16 electoral opportunity is an important principle for 17 the state. Is that an obligation? I don't know 18 that that rises to the level of an obligation.</p> <p>19 Q. Now, in the second paragraph here under 20 Section 8, the last sentence says: "Each time I 21 examined a decision with both racial and partisan 22 elements in the design of the state's plan, I found 23 that racial factors predominated over not only 24 traditional principles, but even over partisan 25 ones." Where, in your report, is that examination</p>	<p style="text-align: right;">Page 192</p> <p>1 the public testimony. 2 So I think that what I'm getting at, in 3 the Conclusion, is that both the kind of 4 quantitative analysis that's offered in Figure 12 5 and the qualitative analysis that emerged from my 6 review of public testimony and my examination of 7 specific splitting decisions and selective healing 8 decisions, those both point to the same conclusion 9 of racial predominance over even partisan concerns.</p> <p>10 Q. And when you were analyzing the splits 11 and selective healing, to use your term, of 12 precincts, did you review any partisan or political 13 data as part of that analysis?</p> <p>14 A. Well, I did. And you can see that in 15 the public testimony. So, for example, in 16 Dorchester County Tim Lewis identifies himself as 17 the chair of the Democratic Party, whereas in the 18 Coastal region Scott Anderson identifies himself in 19 the federation of Republican men. So there is quite 20 a bit of partisan self-identification taking place 21 in the public testimony, and that's what I'm 22 referring to.</p> <p>23 Q. And when you were considering the splits 24 and selective healing precincts, again, to use your 25 term, did you look at election data with respect to</p>
<p style="text-align: right;">Page 191</p> <p>1 of those decisions recorded or discussed?</p> <p>2 A. Well, the most direct place that racial 3 and partisan -- the tension between racial and 4 partisan motivations is addressed is in Figure 12 5 which we just spent time unpacking. So you're 6 asking where else have I compared racial to partisan 7 motivations other than that section?</p> <p>8 Q. If anywhere, yes. I'm just trying to 9 understand -- first I'm trying to understand, you 10 said, "I examined a decision with both racial and 11 partisan elements." I'm trying to understand what 12 decisions you're referring to.</p> <p>13 A. I mean a placement of the lines. So, 14 for instance, looking at Figure 3, which looks at 15 the terrain that has moved in and out of CD 6, that 16 those are places where you can localize decisions 17 that have been made in the shift from the benchmark 18 to the enacted plan. And I find that many of those 19 decisions, particularly about what I have called, in 20 this report, the selective healing of counties and 21 VTDs and other relevant geounits, many of the splits 22 that are not chosen for being healed or addressed 23 are, as I describe here, in neighborhoods 24 particularly salient to Black communities. And that 25 conclusion is drawn, once again, from a review of</p>	<p style="text-align: right;">Page 193</p> <p>1 those splits or repairs of precincts?</p> <p>2 A. I think -- tell me if I'm understanding 3 right, you're asking, in my analysis that looked at 4 particular precincts, did I look at those precincts' 5 voting history?</p> <p>6 Q. Yes.</p> <p>7 A. Yes, I certainly had that data available 8 to me. I didn't do a kind of systematic 9 quantitative analysis that I presented in the 10 report.</p> <p>11 Q. Okay. That's what I'm getting at. So I 12 think it's section 5 of your report which we can 13 turn to, if helpful, but I didn't see anything in 14 section 5 that did any kind of electoral analysis. 15 Is that right?</p> <p>16 A. That is right, section 5, except in the 17 ways that it refers back to the testimony in the 18 appendix, some of which, again, is partisan. 19 Section 5 doesn't, in the body, talk about 20 partisanship. But it was certainly part of the 21 holistic and qualitative review.</p> <p>22 Q. But, for example, you didn't use the 23 election data set that you were provided in Figure 24 12 when analyzing the district splits or shifts in 25 District 5 or in section 5, is that right, or</p>

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1 section 4? 2 A. I did think about that data but did not 3 present a quantitative summary of it in the report. 4 Q. Okay. So, for example -- this is just 5 an example, you didn't say: Look at the Charleston 6 splits, which you talk about in section 5, and 7 analyze whether those splits had a partisan pattern 8 to them based on election data and past election 9 results? 10 A. I did look at -- I'm trying to be 11 complete in my answers. I did look at -- for the 12 terrain pictured in Figure 3, I did look at partisan 13 balance as well as racial balance of those areas. 14 And I determined that, on the whole, they were more 15 racially skewed than they were partisan skewed. But 16 I did not present a systematic discussion or a 17 quantitative discussion of that in my report. But 18 it is my belief, based on the analysis that I did, 19 both quantitative and qualitative, that this moved 20 terrain is more racially distinctive than it is 21 partisan skewed. 22 Q. But you haven't reported -- you haven't 23 said that in your report. Correct? 24 A. That's right. 25 Q. And you haven't provided any supporting	Page 194 1 A. Yes. 2 Q. This document, do you recognize this 3 document? 4 A. Yes. This is my CV, although I can't 5 yet tell whether it's the most recent update. But 6 it's my CV. 7 Q. And how would you tell whether it's the 8 most recent update? 9 A. I can see now that it is, yes. 10 Q. I don't think I have any further 11 questions on that. Thank you. 12 Dr. Duchin, if I have done this 13 correctly, Exhibit 7, the expert report of Sean 14 Trende should be on the screen. Can you see that? 15 A. I can. 16 (Exhibit No. 7, Expert Report of Sean P. Trende, was 17 marked) 18 BY MR. GORE: 19 Q. And are you familiar with this document? 20 A. Yes. 21 Q. Have you read it? 22 A. Yes. This is the -- just be clear, the 23 report dated -- I'm looking for a date. There is no 24 date on the first page. Yes, the last page. Yes, 25 I'm familiar with this report.
Page 195 1 data for that view in your report. Correct? 2 A. Well, I think you have all the data that 3 constitutes these figures, but it's true that I have 4 not provided any such demonstrative in the report. 5 Q. And you haven't provided a chart or any 6 breakdown of reconstituted election data for those 7 areas identified in Figure 3. Correct? 8 A. That's right. I have not provided that. 9 But it is something that I thought about in forming 10 my impressions. 11 MR. GORE: So at this point we have been 12 going again for a little bit than over an hour. Can 13 we go off the record for just a second? 14 (Break In Proceedings) 15 MR. GORE: Let's go ahead and go back on 16 the record. 17 BY MR. GORE: 18 Q. Dr. Duchin, did you discuss your 19 testimony or this deposition with anyone during the 20 break? 21 A. No, I didn't. 22 Q. I would like to show you a new exhibit 23 which is now marked as Exhibit 6. 24 (Exhibit No. 6, Curriculum Vitae of Moon Duchin, 25 PhD, was marked)	Page 197 1 Q. And this is the report from April 18th, 2 2022. Is that right? 3 A. Correct. 4 Q. Do you recall whether Mr. Trende's 5 report mentions your analysis in this case anywhere? 6 A. I don't believe he mentions my analysis 7 or used my name anywhere. 8 Q. And you submitted a rebuttal report in 9 this case. Is that correct? 10 A. I think I called it a response, but yes. 11 Q. And if Mr. Trende's report did not 12 mention you or your analysis, why did you submit a 13 rebuttal or response report? 14 A. To respond to several of the points that 15 he made that I felt were related to those that I had 16 discussed. 17 (Exhibit No. 8, May 4, 2022 Response to the Expert 18 Report of Sean P. Trende dated April 18, 2022, was 19 marked) 20 BY MR. GORE: 21 Q. So if I have done this correctly, 22 everybody has just watched me upload Exhibit 8 into 23 Exhibit Share. Can you see that, Dr. Duchin? 24 A. I can see it, yes. 25 Q. And is this the report that you were

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<p style="text-align: right;">Page 198</p> <p>1 just referring to, your response or rebuttal report?</p> <p>2 A. Yes. That's correct.</p> <p>3 Q. I note that the title just says</p> <p>4 "Report."</p> <p>5 A. That's true. This says I have been</p> <p>6 asked to provide a brief response.</p> <p>7 Q. Right. And so that is dated May 4th,</p> <p>8 2020 -- or 2022?</p> <p>9 A. That's right.</p> <p>10 Q. Thank you. Thank you for that</p> <p>11 correction. So I just want to ask a few questions</p> <p>12 about your rebuttal report.</p> <p>13 A. Yes.</p> <p>14 Q. So under Section 2 that you have titled</p> <p>15 as Summary, the second bullet point is what I would</p> <p>16 like to start asking you questions about.</p> <p>17 A. Yes.</p> <p>18 Q. The second sentence says: "The</p> <p>19 alternative plan shown in my previous report,</p> <p>20 section 6.2, including Figure 11, is just one</p> <p>21 example. 92 percent of the population is assigned</p> <p>22 to districts exactly as in Enacted2022."</p> <p>23 A. Yes.</p> <p>24 Q. And I believe we talked about this</p> <p>25 alternative earlier today, what we were talking</p>	<p style="text-align: right;">Page 200</p> <p>1 core preservation number. You wouldn't learn that</p> <p>2 just from multiplying, but I would agree that that's</p> <p>3 probably true.</p> <p>4 Q. And the third bullet point, you discuss</p> <p>5 Mr. Trende's statement about repairing split</p> <p>6 counties and precincts?</p> <p>7 A. Yes.</p> <p>8 Q. And then you mention the Harpoonian</p> <p>9 map?</p> <p>10 A. Yes.</p> <p>11 Q. And I believe what you say here is</p> <p>12 substantially fewer subdivision splits?</p> <p>13 A. That is what I say here, yes.</p> <p>14 Q. And is that based on the numbers that</p> <p>15 are in your other report?</p> <p>16 A. Yes, the ones we have already reviewed.</p> <p>17 Q. And do you know how the Harpoonian map</p> <p>18 compares to the enacted plan with respect to</p> <p>19 precinct splits or VTD splits?</p> <p>20 A. I don't know. I'm trying to think if --</p> <p>21 no, that number is not in the report, I'm fairly</p> <p>22 sure. But if you think it is, please just show it</p> <p>23 to me.</p> <p>24 Q. Yeah, I don't believe it is. I'm just</p> <p>25 trying to confirm that I didn't miss something.</p>
<p style="text-align: right;">Page 199</p> <p>1 about, the cracking portion of your report. Is that</p> <p>2 correct?</p> <p>3 A. I think it did come up in passing.</p> <p>4 Q. And you say that 92 percent of the</p> <p>5 population in that plan is the same -- is assigned</p> <p>6 to districts exactly as in the enacted plan.</p> <p>7 A. Yes.</p> <p>8 Q. Did you also run any kind of core</p> <p>9 retention analysis on this plan, your alternative</p> <p>10 plan, compared to the benchmark plan?</p> <p>11 A. I must have, yes. I don't have those</p> <p>12 numbers in front of me, but it's quite easy to</p> <p>13 compare any two plans, and so I suspect that I have</p> <p>14 comparison numbers for every pair of plans.</p> <p>15 Q. Did you provide those comparison plans</p> <p>16 or comparison numbers in this report?</p> <p>17 A. No. But you can get a -- you can get an</p> <p>18 estimate by multiplying. So if this has 92 percent</p> <p>19 agreement and that plan has a certain percent core</p> <p>20 retention, then you can estimate by multiplying how</p> <p>21 much this compares to the benchmark.</p> <p>22 Q. And if we conducted that estimate here,</p> <p>23 would your alternative plan have a lower core</p> <p>24 preservation number than the enacted plan?</p> <p>25 A. Oh, I suspect that it does have a lower</p>	<p style="text-align: right;">Page 201</p> <p>1 A. I tend to agree with you.</p> <p>2 Q. Wonderful. And do you know how the</p> <p>3 Harpoonian map performs, whether it performs better</p> <p>4 or worse than the enacted map on preserving the</p> <p>5 cores of the benchmark districts?</p> <p>6 A. Oh, it must be worse, because the</p> <p>7 enacted plan is so much like the benchmark. And</p> <p>8 since -- it follows since the Harpoonian plan makes</p> <p>9 big changes that it must have lower core retention.</p> <p>10 Q. And do you know how the Harpoonian map</p> <p>11 performs on any partisan metrics or outcomes?</p> <p>12 A. Well, yes. We just reviewed some of</p> <p>13 that. So we can see, in Figure 12 from my first</p> <p>14 report, how it performs in the probative elections</p> <p>15 and in the other Democratic elections.</p> <p>16 Q. And as I recall that discussion, the</p> <p>17 Harpoonian plan results in more wins for the</p> <p>18 Democratic candidate than the enacted plan. Is that</p> <p>19 correct?</p> <p>20 A. Yes. Looking at Figure 12 that's true</p> <p>21 both for the probative races, and for the other</p> <p>22 races it has a few more wins.</p> <p>23 Q. So I believe here, in section 3, on the</p> <p>24 next page of core retention --</p> <p>25 A. Yes.</p>

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<p style="text-align: right;">Page 202</p> <p>1 Q. -- you note in the first paragraph the 2 relative core retention percentages between the 3 enacted plan and the Harpoonian plan. Is that 4 right? Am I reading that correctly?</p> <p>5 A. Let me review. Yes. "It essentially 6 revises the state's plan in a single boundary line." 7 So it has an average core retention score of nearly 8 92 percent but gets a markedly better electoral 9 opportunity, et cetera, et cetera.</p> <p>10 Q. So back to page 1, this bullet point at 11 the bottom --</p> <p>12 A. Yes.</p> <p>13 Q. -- in referring to the Harpoonian map, 14 you say: "This map is comparable or superior to 15 state plan Enacted2022 in all traditional 16 districting principles and provides measurably 17 greater minority opportunity to elect." Did I read 18 that correctly?</p> <p>19 A. Yes.</p> <p>20 Q. But it doesn't perform comparably or 21 superior to an Enacted2022 on core preservation or 22 VTD splits. Is that right?</p> <p>23 A. Oh, I don't have the VTD split number in 24 front of me, but -- and honestly, at the moment I 25 cannot remember if I made that comparison. I simply</p>	<p style="text-align: right;">Page 204</p> <p>1 valance or valence? 2 A. It's valence. 3 Q. Okay. Can you explain to me what that 4 means?</p> <p>5 A. Sure. I mean, sometimes people describe 6 core retention as a good government principle, and 7 at least as often they describe core retention as 8 cutting against good government principles.</p> <p>9 Q. And are you aware of how it has been 10 described in any laws or prior cases in South 11 Carolina?</p> <p>12 A. I am aware, let's see, the Guidelines 13 say that they are drawn from, I think, in 14 particular, the Senate Guidelines. I just want to 15 get this right. They say they are drawn, in part, 16 from a 2002 opinion, a 2012 opinion and input 17 received in public hearings. So that leads me to 18 suspect, since they talk about constituent 19 consistency, it's a reasonable guess that it would 20 have potentially been discussed in some of those 21 opinions. But I don't know, to be clear.</p> <p>22 Q. Yeah. And in your opinion is preserving 23 cores a traditional districting principle?</p> <p>24 A. Right. So I have made an effort here -- 25 the term "traditional" is a bit vague. And I do</p>
<p style="text-align: right;">Page 203</p> <p>1 can't remember if I made that comparison. 2 As for cores, I think that there is a 3 sort of judgment question as to whether core 4 preservation is a traditional principle. I think 5 you could -- you could call it traditional in that 6 it is often cited, but it is also often omitted from 7 most of the traditional principles. So I did not 8 mean to include that here. And as you know, I 9 didn't include core retention in the previous 10 report's metrics.</p> <p>11 Q. Is core preservation identified as a 12 principle in the Senate Guidelines?</p> <p>13 A. It's in one set and not the other. So I 14 believe you if you say it's the Senate and not the 15 House.</p> <p>16 Q. Now turning back to section 3 --</p> <p>17 A. Yes.</p> <p>18 Q. -- I believe you say what you just said, 19 which is in the second paragraph, first sentence: 20 "The retention of prior districts is a commonly 21 articulated principle in redistricting."</p> <p>22 A. Yes.</p> <p>23 Q. And then you go on to say: "It can be 24 described in terms of a positive or a negative" -- 25 and this is another good word for me, is that</p>	<p style="text-align: right;">Page 205</p> <p>1 certainly concede that it is an often considered 2 principle. So traditional, in that sense, yes. In 3 my opinion, is it a good government principle? That 4 really depends on the way that it's put in place. 5 It's just very situational. I have seen instances 6 where I think it is being carried out in the best 7 interests of voters and instances where it is not. 8 Q. So I would like to probe that a little 9 bit more. There is a sentence in the second 10 paragraph that starts: "In this case." 11 A. Yes. 12 Q. "In this case, the appeal to core 13 preservation is used to keep minority population 14 dispersed across multiple districts, whereas the 15 shifting population and the reduction in BVAP in CD 16 would likely have led to the creation of new 17 opportunities in a neutral process." So my first 18 question is, is the neutral process referred to here 19 what we discussed in your prior report or does that 20 refer to something else? 21 A. I'm sorry. I'm just trying to catch up. 22 Se we are in section 3 of the response report? 23 Q. Of the response report. And it's about 24 the middle of that second paragraph, fifth line 25 down, it starts at the very end of the line,</p>

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<p style="text-align: right;">Page 206</p> <p>1 right-hand side of the line.</p> <p>2 A. Yes. Thank you. That's right. "The</p> <p>3 appeal to core preservation is used to keep" -- or</p> <p>4 you might say used to justify, either way --</p> <p>5 "minority population dispersed across multiple</p> <p>6 districts, whereas the shifting population and the</p> <p>7 reduction in BVAP in CD 6 would likely have led to</p> <p>8 the creation of new opportunities in a neutral</p> <p>9 process." Right. Well, it's certainly true that</p> <p>10 the ensemble generation process is meant to model</p> <p>11 neutral process. But I don't mean to imply that</p> <p>12 ensemble generation is a perfect representation of</p> <p>13 every possible neutral process. It is one kind of</p> <p>14 neutral process.</p> <p>15 Q. What is the neutral process being</p> <p>16 referred to in this sentence?</p> <p>17 A. This sentence means if the -- if the</p> <p>18 Guidelines are taken literally, they seem, to me, to</p> <p>19 say -- and here it's a little bit hard because the</p> <p>20 House and the Senate Guidelines are slightly</p> <p>21 different, but trying to generalize across both they</p> <p>22 seem to say that considerations such as cores, if</p> <p>23 they appear at all in the Guidelines, are described</p> <p>24 as not meriting a reduction in minority electoral</p> <p>25 opportunity. I think that's fair to say about the</p>	<p style="text-align: right;">Page 208</p> <p>1 voting opportunity under the Guidelines?</p> <p>2 A. Well, literally, here it says a manner</p> <p>3 that prevents minorities from electing their</p> <p>4 candidates of choice. So I suppose, if you ask that</p> <p>5 of the authors of the Guidelines what's the intent</p> <p>6 of their phrasing, I think that means dispersing in</p> <p>7 a manner that prevents relative to what was</p> <p>8 possible. I think what that means, at least just</p> <p>9 the plain English reading, I think -- and you can</p> <p>10 tell me if you agree -- is that, for example, if</p> <p>11 there are several competing options presented, one</p> <p>12 has more opportunity and one has less, then core</p> <p>13 preservation can't be reason to choose the one with</p> <p>14 less opportunity. That seems, clearly, to be how to</p> <p>15 read this.</p> <p>16 Q. And so, in your opinion, do the</p> <p>17 Guidelines require the General Assembly to choose</p> <p>18 the plan with the highest minority voting</p> <p>19 opportunity, all other things being equal?</p> <p>20 A. No. And to explain that fully, I'm not</p> <p>21 sure they require anything. It's especially hard</p> <p>22 for me to tell from the way they are written. But I</p> <p>23 don't read them to require anything. I read them</p> <p>24 only to provide guidelines, although they do say</p> <p>25 that they have the authority to determine the</p>
<p style="text-align: right;">Page 207</p> <p>1 Guidelines. And so I find that in the spirit of the</p> <p>2 Guidelines they don't provide a justification for</p> <p>3 reduced minority electoral opportunity.</p> <p>4 Q. And when you say the Guidelines don't</p> <p>5 provide a justification for reduced minority</p> <p>6 opportunity, what is the reduced minority</p> <p>7 opportunity contemplated but not justified by the</p> <p>8 Guidelines?</p> <p>9 A. Is there something else?</p> <p>10 Q. Well, I'm trying to understand what you</p> <p>11 just said. So maybe reduced compared to some other</p> <p>12 baseline or comparator, but I think you said that</p> <p>13 the Guidelines -- that other considerations in the</p> <p>14 Guidelines can't be read to merit a reduction of</p> <p>15 minority voting opportunity.</p> <p>16 A. That's right. In particular, House</p> <p>17 Guidelines IX a. make that very explicit, that any</p> <p>18 of the lower-ranked considerations such as</p> <p>19 incumbency and COIs and so on, if there is a</p> <p>20 conflict with those and minority opportunity,</p> <p>21 minority opportunity should be given priority. I</p> <p>22 think it pretty clearly says that in IX a., to my</p> <p>23 reading.</p> <p>24 Q. And so what would be the comparator to</p> <p>25 determine whether there has been reduced minority</p>	<p style="text-align: right;">Page 209</p> <p>1 criteria. But I still don't think that rises to the</p> <p>2 level of a legal requirement.</p> <p>3 Q. Okay. So I'm trying to understand your</p> <p>4 hypothetical. You said if there were two plans</p> <p>5 presented, one with higher minority voting</p> <p>6 opportunity and one with lower minority voting</p> <p>7 opportunity, preservation of cores could not be</p> <p>8 invoked to choose the plan with lower minority</p> <p>9 voting opportunity.</p> <p>10 A. Under the Guidelines.</p> <p>11 Q. Under the Guidelines. So my question</p> <p>12 is, is it your reading of the Guidelines that when</p> <p>13 all other things are equal with respect to other</p> <p>14 principles or traditional criteria, the General</p> <p>15 Assembly had to choose the plan with the highest</p> <p>16 minority voting opportunity?</p> <p>17 A. No. But you presented a scenario in</p> <p>18 which -- or I think we are discussing a scenario in</p> <p>19 which all other things are equal and the differences</p> <p>20 are a tradeoff strictly between district core</p> <p>21 preservation and minority electoral opportunity. If</p> <p>22 we posit that that's the tradeoff, all other things</p> <p>23 being roughly equal, then I wouldn't say the</p> <p>24 Guidelines require anything. But I would say they</p> <p>25 direct the legislature to choose the one with more</p>

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<p style="text-align: right;">Page 210</p> <p>1 minority opportunity as opposed to higher core 2 retention, yes. I think that is directed, but I 3 wouldn't say required.</p> <p>4 Q. So let me rephrase and see if I 5 understand your point. Is it your reading that the 6 Guidelines direct the General Assembly not to trade 7 off compliance with some other principle at the 8 expense of minority voting opportunity?</p> <p>9 A. So sorry, but I think my entering got 10 cut out in the middle of your sentence. Can you 11 repeat that?</p> <p>12 Q. It was such a good sentence, I don't 13 know, but I will try. Is it your reading of the 14 Guidelines that the Guidelines direct the General 15 Assembly not to trade off less minority voting 16 opportunity for better compliance with the other 17 principles in the Guidelines or considerations in 18 the Guidelines?</p> <p>19 A. Well, an exception might be population 20 balance, which is in the first tier here. But 21 specifically as to core retention, my reading is 22 that they are directed to prioritize minority 23 electoral opportunity over core retention. That's 24 correct.</p> <p>25 Q. And what about over other principles</p>	<p style="text-align: right;">Page 212</p> <p>1 part and parcel of redistricting. Is that right? 2 A. Yes.</p> <p>3 Q. Is it your reading that the Guidelines 4 direct the General Assembly, when faced with such 5 tradeoff between minority voting strength on the one 6 hand and a second-tier consideration on the other 7 hand, to choose the option that prioritizes minority 8 voting strength?</p> <p>9 A. I think that's the plain language here. 10 And let me stipulate that I might not have written 11 it exactly this way. But reading the way they wrote 12 it, I do think that's what they say.</p> <p>13 Q. Okay. And have you discussed the 14 Guidelines with whoever wrote them?</p> <p>15 A. I certainly haven't. And I have no idea 16 who wrote them.</p> <p>17 Q. And do you know one way or another 18 whether the standard in the Guidelines was simply 19 meant to be an articulation of what Section 2 of the 20 Voting Rights Act requires?</p> <p>21 A. Not simply. It says that it goes beyond 22 the Voting Rights Act. And both sets of the 23 Guidelines reference other principles such as equal 24 protection. So it's not simply a recording of 25 Section 2.</p>
<p style="text-align: right;">Page 211</p> <p>1 that you have placed in the second tier?</p> <p>2 A. Okay. Let's review. Yes. I think it 3 says the requirements addressed in sections 1, 2, 3 4 and 4 should be given priority if there is a 5 conflict.</p> <p>6 Q. So on your reading, the Guidelines 7 direct the General Assembly to maximize voting -- 8 minority voting strength to the extent it can do so 9 while trading off compliance with the second-tier 10 considerations?</p> <p>11 A. I would shy away from the word 12 "maximize" which has a very specific meaning for me. 13 I don't think there is maximization here. But I do 14 think that, again, to quote, if there is a conflict, 15 the requirements that include minority electoral 16 opportunity should be given priority. So they are 17 directed, in case of conflict, to prioritize 18 minority electoral opportunity over compactness over 19 district cores and so on.</p> <p>20 Q. So this is helpful, but let me ask it 21 another way, if that's okay. We talked earlier that 22 redistricting involves tradeoffs. Right? That the 23 criteria may cut in different directions or that a 24 map drawer may prioritize one criterion or 25 consideration over another and that tradeoffs are</p>	<p style="text-align: right;">Page 213</p> <p>1 Q. And do the Guidelines refer to anything 2 other than equal protection, the U.S. Constitution 3 and the Voting Rights Act when discussing 4 considerations of minority voting strength?</p> <p>5 A. They do. They also refer to the 6 opinions of the Supreme Court of the United States. 7 Q. And have you reviewed those opinions?</p> <p>8 A. I believe I have read all the relevant 9 opinions. Now, that's not to say that I have an 10 attorney's professional vetted interpretation of 11 them, but I believe I have read all the relevant 12 things.</p> <p>13 Q. And have you analyzed whether the 14 enacted plan violates Section 2?</p> <p>15 A. That was not part of my assignment.</p> <p>16 Q. And I just want to return to this 17 sentence again: "In this case, the appeal to core 18 preservation is used to keep minority population 19 dispersed across districts" -- "multiple districts," 20 that again, reads like a statement of the map 21 drawer's purpose, "used to keep minority population 22 dispersed." Am I reading that correctly?</p> <p>23 A. Well, yes. That is what it says, yes. 24 When we went over it a few moments ago, maybe 25 fifteen minutes ago, I said that might have been</p>

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<p style="text-align: right;">Page 214</p> <p>1 better phrased by me as used to keep or used to 2 justify.</p> <p>3 Q. And let's look at the next sentence. I 4 think you say -- it starts: "I am not aware of any 5 principle in law or in published redistricting 6 guidelines that allows for a threshold level of high 7 core preservation to justify excessively 8 race-conscious decisions with a known dilutive 9 effect."</p> <p>10 A. Yes.</p> <p>11 Q. So is it your opinion that the General 12 Assembly or a map drawer, in this case, is using 13 high core preservation to justify excessively 14 race-conscious decisions?</p> <p>15 A. And who were the people you referred to? 16 The map drawer or who?</p> <p>17 Q. The General Assembly. The legislature.</p> <p>18 A. It's a bit hard to identify who all the 19 relevant stakeholders and folks expressing opinions 20 are. So, in particular, the focus of this report is 21 to respond to Sean Trende's expert report. And I do 22 not know the extent to which Trende's 23 representations are consonant with those of the 24 Assembly or the map drawer. So I maybe want to be 25 careful about whose opinions I'm describing. But</p>	<p style="text-align: right;">Page 216</p> <p>1 Well, the sentence that we just reviewed of mine 2 only says I don't know of anything in law that 3 allows for this to justify that. So I'm not 4 ascribing a justification to anyone. I'm just, in 5 particular, here --</p> <p>6 Q. So is this statement -- is this then 7 meant to be a general principle or a description of 8 something in this case, specific to this case?</p> <p>9 A. That sentence, "I am not aware," is a 10 general statement. It is relevant to this case 11 because I feel that in various of the documents that 12 are circulating there are attempts, implicit or 13 explicit, to justify reduced minority electoral 14 opportunity with these kinds of factors being 15 partisan and core-preserving criteria.</p> <p>16 Q. And which documents make that 17 justification expressly or explicitly?</p> <p>18 A. I feel it's explicit in the Trende 19 report. And also in the motion to dismiss it is, 20 let's see, somewhere on the line of implicit and 21 explicit. But we can pull that up. But first I 22 will tell you my general impression is that the 23 motion to dismiss asserts that plaintiffs would need 24 to disambiguate racial from partisan motives. So 25 that, in other words, at least implicitly, if not</p>
<p style="text-align: right;">Page 215</p> <p>1 Trende certainly writes -- and again, that's who I'm 2 primarily responding to, Trende certainly writes as 3 though both core preservation and partisan 4 motivation are justifications for the minority 5 opportunity to elect that is embodied in the plan.</p> <p>6 Q. Have you discussed Mr. Trende's report 7 with him?</p> <p>8 A. With him? I don't think we have met, 9 although I look forward to it.</p> <p>10 Q. And is it possible to read his report 11 not as a justification for any decisions but as an 12 explanation for what he observed in reviewing the 13 plan?</p> <p>14 A. Well, again, I am trying to be quite 15 careful, and so you will forgive me for speaking 16 slowly and deliberately. I'm trying to be quite 17 careful about what opinions I attribute to whom. 18 But his report certainly reads as though the 19 partisan motivations and the core retention are 20 legitimate justifications that explain the reduced 21 minority electoral opportunity.</p> <p>22 Q. So in this sentence is the person doing 23 the justifying in this sentence Mr. Trende or 24 somebody else?</p> <p>25 A. I'm pulling up the sentence again.</p>	<p style="text-align: right;">Page 217</p> <p>1 explicitly, partisan motives are an allowable 2 justification for racially disparate outcomes.</p> <p>3 Q. And have you discussed the motion to 4 dismiss with the author of that motion?</p> <p>5 A. No, I haven't.</p> <p>6 Q. Another question, if I can find it, 7 section 4: "Respect for boundaries, Communities of 8 interest."</p> <p>9 A. Yes.</p> <p>10 Q. The second paragraph, I think what 11 you're talking about is VTD splits in the benchmark 12 plan and the enacted plan?</p> <p>13 A. Yes.</p> <p>14 Q. And maybe it's at the end of paragraph 15 one.</p> <p>16 A. Yes.</p> <p>17 Q. So I just want to make sure I have my 18 facts correct. When the benchmark plan was drawn, 19 it split 13, 2010 VTDs. Is that correct?</p> <p>20 A. Yes.</p> <p>21 Q. And are you aware that South Carolina 22 redrew its VTD lines between 2010 and 2020?</p> <p>23 A. I don't think they are able to redraw 24 their VTD lines. They can redraw their precinct 25 lines, but VTDs are Census Bureau data product.</p>

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<p style="text-align: right;">Page 218</p> <p>1 Q. So are you aware that South Carolina 2 redrew its precinct lines between 2010 and 2020? 3 A. That seems very likely. 4 Q. And by the time the 2020 census data 5 came out, the benchmark plan, at least according to 6 your report, then split 65 2020 VTDs. 7 A. That's right. And just to help clarify 8 this piece of the conversation, let me just say one 9 sentence about VTDs versus precincts. Precincts are 10 a moving target. Not only states but local 11 authorities can change precincts often, at any time, 12 and often -- for any reason. In many cases they 13 don't even have to report those changes to the 14 state, which is a strange state of affairs. 15 VTDs are a once per ten years effort of 16 the Census Bureau to find out a snapshot of those 17 precincts and reconcile with the other census 18 geography. So the reason people in a redistricting 19 analysis like to use VTDs is that they are a fixed 20 target rather than a moving target. 21 So one other piece of the puzzle that's 22 relevant here is that it's quite common, in various 23 states around the country, to draw a plan; and then 24 where that plan split VTDs, to change the precincts 25 to nest better in the plan. So it's a really very</p>	<p style="text-align: right;">Page 220</p> <p>1 Q. Is preserving or keeping VTDs whole a 2 traditional districting principle, in your opinion? 3 A. Good question. It comes back to parsing 4 traditional. But traditionally we talk about 5 political boundaries. It's a bit ambiguous whether 6 precincts are included, but I think they often are 7 included under the umbrella of political boundaries. 8 Q. And is preserving or not splitting VTDs 9 a traditional districting principle, in your 10 opinion? 11 A. Do you mean as distinct from precincts? 12 Q. Sure. 13 A. I don't think the traditional principles 14 will distinguish between those two. 15 Q. And do you recall whether the House or 16 Senate Guidelines identified avoiding VTD or 17 precinct splits as one of the considerations for 18 drawing the congressional plan? 19 A. Yes, I recall that at least one of them 20 did. Let's check quickly. Yeah, VTDs are mentioned 21 by name only in the Senate but not in the House 22 Guidelines. 23 Q. And in your experience, in your opinion, 24 Dr. Duchin, is it possible for a map drawer to 25 preserve cores of districts without engaging in race</p>
<p style="text-align: right;">Page 219</p> <p>1 complicated set of facts here. And I felt that the 2 wording in the Trede report was misleading, made it 3 sound like there were very few VTDs split. But that 4 was partly due to not specifying whether he was 5 talking about 2010 or 2020 VTDs. 6 Q. And do you know anything about whether, 7 in South Carolina, there is a difference between the 8 precinct line and VTD lines in 2020? 9 A. Well, there is probably no economical 10 source of precinct boundary data, and so I wouldn't 11 know how to start to make the comparison. 12 Q. Do you know, one way or the other, 13 whether the state maintains a database of precincts 14 in South Carolina? 15 A. I know that many states, and I believe 16 South Carolina is one, make an effort to keep an 17 up-to-date boundary file. But very few states, and 18 I believe South Carolina is not one, have strong 19 reporting requirements for local authorities. So I 20 do think there is an effort to make current data 21 product, but it's really very hard to do. 22 Q. In your experience does keeping VTDs or 23 precincts whole make election administration easier 24 for election officials than if they are split? 25 A. Definitely.</p>	<p style="text-align: right;">Page 221</p> <p>1 conscious decision-making? 2 A. Well, let me try to answer that simply 3 but fully. I think that, inevitably, 4 decision-makers are aware of the level of -- at 5 least roughly of the level of racial -- of minority 6 electoral opportunity that exists in the benchmark 7 plan. And so implicitly, a decision to prioritize 8 cores is going to be a decision to maintain the 9 status quo, roughly -- roughly speaking of minority 10 electoral opportunity. So is that race conscious? 11 Well, that comes back to the question of whether we 12 are considering proxies. That's not race conscious 13 in the sense that you have a race data layer 14 visible, but it has -- of course it has 15 ramifications for minority electoral opportunity, 16 necessarily. 17 Q. Is it possible for a map drawer, in your 18 experience, to prioritize core preservation without 19 sacrificing minority voting opportunity? 20 A. Definitely, especially in areas that are 21 not diverse. 22 MR. GORE: I think I have no further 23 questions, so I'm ready at this point to pass the 24 witness to whoever would like to ask questions. 25 Maybe Andrew, I think if you maybe have</p>

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<p style="text-align: right;">Page 222</p> <p>1 some questions, want to take over at this point? 2 And Ms. Trinkley, do you have any questions for this 3 witness? 4 MS. TRINKLEY: Yes. I think just one. 5 CROSS-EXAMINATION 6 BY MS. TRINKLEY: 7 Q. Do you know what governmental bodies in 8 South Carolina have the authority to change precinct 9 lines? 10 A. Good question. I don't. I don't 11 specifically know the South Carolina rules, only I 12 have worked with election administrators across the 13 country so I have a sense of how it's done 14 generally. But I don't have specific knowledge of 15 the rules of South Carolina. 16 MS. TRINKLEY: Thank you. That's all 17 the questions I have. 18 MR. MATHIAS: And I have a few. It 19 might be about thirty minutes. Does anybody want a 20 ten-minute break or can we keep going? 21 (Off-Record Discussion) 22 MR. MATHIAS: Well, let's keep going. 23 CROSS-EXAMINATION 24 BY MR. MATHIAS: 25 Q. Dr. Duchin, Andrew Mathias. I know we</p>	<p style="text-align: right;">Page 224</p> <p>1 software programs that's referenced the MGGG 2 Redistricting Lab, GerryChain Python Library? 3 A. That's right. Our two biggest software 4 packages are GerryChain, which is a Markov chain 5 library, and Districtr which is a community mapping 6 tool. 7 Q. It's footnote 4 to your report, or I 8 guess in that 4 reference, the GerryChain Python 9 Library, is that referring to software or is that 10 referring to something else that is proprietary to 11 the MGGG or Tufts? 12 A. It's software, and it's fully public. 13 It's not proprietary to anyone. It's fully public, 14 and I should mention much copied. 15 Q. Okay. You mentioned that it is sort of 16 a group of people that I have seen online that it 17 grew out of the metric geometry and gerrymandering 18 group. Are any of these -- well, either yourself, 19 as the primary investigator, staff, post-doc or 20 undergrad folks paid by MGGG or Tufts for their work 21 with MGGG? 22 A. Yes. For example, right now the staff 23 of MGGG, through Tisch College, is a program 24 administrator and a research analyst. That's much 25 reduced from last summer, around time that the</p>
<p style="text-align: right;">Page 223</p> <p>1 met virtually some months ago. I don't remember 2 when, frankly. I represent the House defendants in 3 this case. I have, hopefully, just a handful of 4 questions. And you can answer this first one 5 however you want. What is the MGGG Redistricting 6 Lab? 7 A. Okay. So I am a professor at Tufts 8 University, and as I mentioned I'm affiliated with 9 the Tisch College of Civic Life. And as part of 10 Tisch College I run the lab called MGGG 11 Redistricting Lab. What it means to run a lab is 12 that we are a collection of people. We have staff. 13 We have -- I'm the only tenure stream faculty, but 14 we have had postdoctoral scholars, graduate student 15 affiliates, undergraduate, as well as, as I said, 16 full-time and part-time staff. So we are a 17 collection of people whose primary function is to do 18 scholarly research in redistricting. And so we have 19 a significant output of peer-reviewed articles, a 20 book that just came out, which I believe we 21 discussed several months ago. And we also write a 22 substantial body of open-source software that we use 23 and that we hope others will use in analyzing not 24 only redistricting, but other voting-rights issues. 25 Q. Okay. Is one of those open-source</p>	<p style="text-align: right;">Page 225</p> <p>1 census data came out when we had, I think, over a 2 dozen people on staff. 3 Q. And how much are you paid for your work 4 with MGGG? 5 A. I am not paid for my work with MGGG. 6 It's part of my profile as a professor. 7 Q. Okay. Is everyone that works with MGGG, 8 other than you, paid or are there some folks that 9 are doing it as part of their academic work? 10 A. Yes, that's correct, some are doing 11 academic work with us, which is typically unpaid, 12 and others are doing sort of data analysis that is 13 typically paid for. 14 Q. Okay. Is MGGG, in some way shape or 15 form, located in a physical space on Tufts' campus? 16 A. Yes. I'm sitting in it. We have 17 offices in Barnum Hall on Tufts' campus. 18 Q. Okay. Does MGGG pay rent to Tufts for 19 the space it has in Barnum Hall? 20 A. That's a bit of a subtle question. We 21 raise grant support which has a component that's 22 called "indirect" which is used to defray costs like 23 keeping the lights on and so on. So when we get a 24 grant -- 25 Q. Overhead?</p>

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<p style="text-align: right;">Page 226</p> <p>1 A. Overhead. Exactly. So when we get a 2 grant, say, from the Sloan Foundation, 10 percent of 3 the amount that goes to us will be added on top and 4 will go to the University. When we get a grant from 5 the National Science Foundation, it's 66 percent.</p> <p>6 I would add something, though, to 7 clarify all this. We have been discussing the 8 academic piece, which is the lab, as part of Tufts. 9 But I also have an LLC that I use for consulting. 10 And for matters relating to litigation, pay does not 11 go through the University. I'm a professor who has 12 several roles. I have a robust conflict of interest 13 policy that I follow here at the University, and I 14 keep litigation income quite separate from the 15 University and its functions.</p> <p>16 Q. Yes, I saw the invoices were from the 17 Redistricting Lab, LLC. So you have mentioned 18 something, and I may not have it correct, but I will 19 see if I can find the word. You mentioned that you 20 rely on other people to do things such as data 21 curation, writing code, running computational 22 scripts and then reviewing public hearing testimony. 23 Who did that for the purposes of your report?</p> <p>24 A. So I have multiple research assistants. 25 And in the invoices that I submitted to LDF, they</p>	<p style="text-align: right;">Page 228</p> <p>1 provided research support, as reflected in the 2 invoices, and those are Cora Chanel Richardson who 3 has a degree in computer engineering and provides 4 support on the computing side, and Liz Kopecky who 5 has a background in policy and project management.</p> <p>6 Q. And I'm assuming both Cora and Liz also 7 work for MGGG, or is that incorrect?</p> <p>8 A. They are also both employees of Tisch 9 College.</p> <p>10 Q. Okay. Doing work for MGGG?</p> <p>11 A. Yes.</p> <p>12 Q. And those two individuals, Cora and Liz, 13 were the ones who did the work of data curation, 14 writing code, running computational scripts and 15 reviewing public testimony in support of you in 16 drafting this report?</p> <p>17 A. Yes. But to be clear, so Cora 18 Richardson goes by the name Chanel. And Chanel did 19 the coding and data work and Liz helped review 20 public testimony.</p> <p>21 Q. Would either Chanel or Liz know how to 22 do what they did to support you in writing this 23 report if they had not worked at MGGG?</p> <p>24 A. I would say, in Chanel's case, that she 25 came in with substantial Python expertise. But, I</p>
<p style="text-align: right;">Page 227</p> <p>1 are typically identified Research Assistant 1, 2 Research Assistant 2 and so on. And they are 3 performing analysis under my direction. We can talk 4 about who they are, but first let me just clarify 5 the overall division of labor, the LLC that I 6 mentioned, which is a consulting company, also has, 7 at the moment, one full-time employee and several 8 part-time employees who have nothing to do with the 9 University. So they really are kind of separate 10 options.</p> <p>11 However, it is the case, and again fully 12 in compliance with the conflict of interest policies 13 at my University, that several people work on both 14 sides. So if people who are employed by Tufts 15 University do work for litigation, they do so on 16 evenings and weekends and are compensated through 17 the LLC and not through the University. So even 18 though it may sound like thoroughly intermixed, we 19 are actually quite scrupulous about separation of 20 resources. Having said that, do you want to talk 21 about who the research assistants were who involved 22 in this project?</p> <p>23 Q. Yes. Who were they?</p> <p>24 A. Sure. So I believe for the 25 congressional side there were exactly two people who</p>	<p style="text-align: right;">Page 229</p> <p>1 mean, certainly, working with our particular code 2 base was something that she was trained in over her 3 time in the lab.</p> <p>4 In Liz's case, reviewing public 5 testimony, I think, takes no special knowledge or 6 training.</p> <p>7 Q. So all Liz did was review public 8 testimony?</p> <p>9 A. That's right.</p> <p>10 Q. Did she -- and this is word I'm trying 11 to find -- operationalize -- did she help 12 operationalize that public testimony?</p> <p>13 A. No. I'm the one who synthesized, 14 summarized and drew the operational regions that 15 were used in the ensemble analysis.</p> <p>16 Q. Okay. In your testimony you 17 mentioned -- well, for the most part you testified 18 in the first-person singular. On occasion you would 19 say something in the first-person plural, our 20 method. We found our ensemble. We, our, that's you 21 and MGGG or you and who?</p> <p>22 A. Not necessarily. Depending on context, 23 it often will mean me and collaborators, that is 24 the -- this is something I tried not to be pedantic 25 about throughout the course of this deposition, but</p>

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<p>1 there are algorithms and then there are 2 implementations and code. The algorithms are fairly 3 abstract. They tell you, kind of, the mathematical 4 ideas behind what you will be doing. And then the 5 code is programming. So often when I say "we" or 6 "our," I'm talking about my scientific 7 collaborations. For example, the algorithms, the 8 concept behind the GerryChain package are described 9 in a peer-reviewed paper that appeared in the 10 Harvard Data Science Review that's joint work with 11 Darryl DeFord and Justin Solomon. Darryl is a 12 professor at Washington State and Justin is a 13 professor at MIT. So partly I'm trained to say 14 "our" when I talk about joint work so that I don't 15 forget to acknowledge that so much scientific work 16 is done collaboratively.</p> <p>17 Q. Fair. And that article you're talking 18 about is "Mathematics of nested districts: The 19 case" -- no. I'm sorry. It is: "Recombination: A 20 family of Markov chains for redistricting"?</p> <p>21 A. And Markov is M-A-R-K-O-V. That's 22 correct.</p> <p>23 Q. And that's the article you list in your 24 references as number 3?</p> <p>25 A. I can check that, but that is the main</p>	<p>1 supporter of MGGG is the National Science 2 Foundation. Is that correct? 3 A. Yes. 4 Q. And the National Science Foundation, is 5 an agency of the federal government that gives 6 grants. Is that correct? 7 A. Yes. And, in particular, we -- the lab 8 received a million-dollar grant to study what we 9 called network science and census data. 10 Q. Is that the only grant that the lab -- 11 and I'm using that to refer to MGGG -- has received 12 from the National Science Foundation? 13 A. No. To be clear, when you apply for an 14 NSF grant you have a PI, or a principal 15 investigator. And that PI is a person, not a lab. 16 So I am the PI on numerous NSF grants. I have, 17 typically, several that are active at any time. 18 Q. So is that grant that you talked about 19 the only grant that has been used to fund MGGG, the 20 only NSF grant? 21 A. No. I had a -- for example, there 22 really have been numerous grants that -- partly from 23 the activities of the lab, but another example would 24 be a grant from several years ago that funded a 25 summer program called the "Voting Rights Data</p>
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<p>1 article that offers the kind of theoretical 2 framework for the ensemble process. 3 Q. Can you describe for a minute, then, 4 how -- how critical the methods described in that 5 article are for your expert report and rebuttal that 6 we have been discussing today? 7 A. Sure. The parts of my report that use 8 ensembles, which I believe are sections 6 and 7, but 9 we can check, those rely on those ideas of 10 recombination. The traditional districting 11 principles, the quality and the review, and so on, 12 does not rely on Markov chains. 13 Q. And those are a fairly critical form of 14 maybe the core of your opinion and report. Is that 15 correct? 16 A. Well, I wouldn't say that the work is 17 holistic and has many components, but I do find the 18 ensemble evidence to be compelling. 19 Q. Okay. And you find the ensemble 20 evidence to be compelling and believe that the court 21 should find it compelling as well. Correct? 22 A. That would be my hope. 23 Q. Okay. On the MGGG website there is a 24 sort of, I guess, donation page or fundraising page, 25 and it indicates that the largest financial</p>	<p>1 Institute." 2 Q. Okay. Is the million dollar grant 3 you're talking about Convergence Accelerator Phase I 4 Network Science and Census Data? 5 A. Yes, that's the one. And a million is a 6 round number. It might have been \$964,000. 7 Q. Does \$962,177 sound right? 8 A. That sounds perfect. 9 Q. Okay. Do you ever interact with Laura 10 Campbell at NSF? 11 A. Laura Campbell was the program director 12 for the convergence accelerator, I think. I think 13 that's right. That sounds right. 14 Q. That's correct. And just looking at the 15 abstract, it says that the funds obligated to date 16 were the 962,000 and change per fiscal year 2019 and 17 that the end date was May 31st, 2021? 18 A. I believe we got a no-cost extension for 19 another year, although I could check the records to 20 be sure. 21 Q. Okay. And pursuant to this grant -- or 22 by way of this grant did Tufts, you as principal 23 investigator, receive anything in addition to the 24 \$962,000 and change in 2019? 25 A. As part of that grant there was a</p>

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<p style="text-align: right;">Page 234</p> <p>1 supplemental grant called a "rapid grant." The NFS 2 structure is really labyrinth, so I will try to 3 describe this, but it can be complicated. So there 4 was a second grant, called a rapid grant, for an 5 additional \$100,000 that piggybacked on the 6 convergence accelerator and that we used to model 7 how campuses could support the COVID response of 8 hospitals.</p> <p>9 Q. Okay. So this grant either initially 10 or -- well, initially and adding this piggyback 11 grant, exceeded a million dollars?</p> <p>12 A. Yes.</p> <p>13 Q. Okay. On this abstract -- well, the 14 abstract, itself, says that it was last modified on 15 November 30th, 2021 by you. Do you remember 16 modifying it?</p> <p>17 A. Not specifically, no.</p> <p>18 Q. Do you have any reason to believe that 19 you did not modify it or somebody else did?</p> <p>20 A. I don't think it was modified after it 21 was initially submitted. I don't have a memory of 22 that. But maybe you can tell me if there are 23 specific elements that you would like me to try to 24 recall.</p> <p>25 Q. There is a section called "Publications</p>	<p style="text-align: right;">Page 236</p> <p>1 few years.</p> <p>2 Q. Okay. So if I understand you correctly, 3 you're saying that this paper, the publication could 4 be attributable to research that was funded by more 5 than just this grant. But do you --</p> <p>6 A. Yes, definitely.</p> <p>7 Q. Do you disagree that this grant, the 8 convergence accelerator grant, at least in part, 9 funded the publication and Recombination: A family 10 of Markov chains for redistricting?</p> <p>11 A. So often my work -- so that particular 12 paper has some, but not a great deal of empirical 13 work of computational output in it. It has some but 14 it's more theoretical. So what is the sense in 15 which that grant supported the paper? It's that 16 particular grant included a buyout for one of my 17 courses. So that meant my teaching load was reduced 18 which enabled me to do more research. So I hope I'm 19 getting at the right thing for your question. 20 That's the sense in which the grant enabled the 21 research, is that it reduced my teaching obligation, 22 allowing me to do more scholarship.</p> <p>23 Q. I will ask it a different way. This is 24 available online. It just says it was -- the 25 abstract was last modified by you in November of</p>
<p style="text-align: right;">Page 235</p> <p>1 produced as a result of this research" and it lists 2 four, but one of those is the Recombination: A 3 family of Markov chains for redistricting. Do you 4 have any reason to believe that you would not 5 attribute that article as being -- or that 6 publication as being produced as a result of the 7 research that this grant funded?</p> <p>8 A. Right. So the policy of NSF is you can 9 hold one or several concurrent grants. For each one 10 you have a proposal which describes the work you set 11 out to do on that grant. So, for example, the 12 convergence accelerator that you talked about has 13 now concluded. But overlapping with it I had 14 another grant through the math department on what I 15 called something like Geometry and Randomness. And 16 a paper like that Markov chain paper would have 17 cited both of those grants and its acknowledgment of 18 funding support. So that is to say if I write a 19 paper that relates to the proposals of multiple 20 grants I will typically credit all of those grants 21 in the funding support for the paper and include the 22 paper in the outcome report for both of the grants. 23 So you shouldn't be surprised if you see that 24 particular paper mentioned in the documentation for 25 multiple of the grants that I have held in the last</p>	<p style="text-align: right;">Page 237</p> <p>1 last year. And under Publications Produced, as in 2 results of this research, it lists the publication 3 that you say forms the basis -- or the methodology 4 discussed in that, and the research discussed in 5 that forms the basis of a significant portion of 6 your report. Do you have any reason to believe that 7 someone other than you listed that article as a 8 publication that was produced as a result of this 9 federally funded research?</p> <p>10 A. I'm afraid I don't understand the 11 question at all.</p> <p>12 Q. I will ask it again. Do you have any 13 reason to believe that the publication that you, 14 along with two others, wrote called Recombination: 15 A family of Markov chains of redistricting, was 16 listed as a publication produced as a result of this 17 research by someone other than you?</p> <p>18 A. No. Of course that was by me. It was 19 probably listed as partly supported by that grant. 20 That is correct. And it would be actually out of 21 line for me to --</p> <p>22 MS. ADEN: Moon, you just froze.</p> <p>23 BY MR. MATHIAS:</p> <p>24 Q. Yeah. I think you froze at "out of line 25 for me to" --</p>

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1 A. It would be out of line for me to have 2 omitted it. I apologize. My internet is getting a 3 little glitchy.	1 A. Definitely. 2 Q. Does Tufts require an annual report of 3 all employees to notify the University of conflicts 4 of interest?
4 Q. So it would be out of line for you to 5 have omitted that publication among those that were 6 produced as a result of this research for the 7 convergence accelerator phase I grant. Correct?	5 A. I'm not sure about all employees, but 6 definitely all faculty.
8 A. Absolutely.	7 Q. Certainly covering you. Correct?
9 Q. Do you recall the date of that grant?	8 A. Yes, definitely.
10 A. No, but I have no reason to dispute the 11 dates that you are representing.	9 Q. And when do you submit those conflict of 10 interest reports?
12 Q. Okay. It says September of 2019. 13 September 10th, to be specific, does that sound 14 about right?	11 A. I submit them whenever I get an email 12 reminder, and I believe I submitted one in the last 13 month.
15 A. Sure.	14 Q. And I don't have the document and I 15 doubt you have it in front of you, but how do you 16 characterize your conflict of interest with your 17 Research Lab, LLC and the work at MGGG?
16 Q. And is that the largest single source of 17 funding that MGGG has received to date?	18 A. I describe the existence of the LLC and 19 I describe my consulting work as being -- I should 20 mention, actually, as we speak, this year I'm on 21 leave for my position at Tufts. So the conflict of 22 interest is simpler than usual because this year I 23 have no obligations as part my professorial 24 position.
18 A. Yes.	25 Q. Is your compensation group reduced
19 Q. You mentioned that -- I call her Liz. I 20 can't think of her name or what she goes by now. 21 Liz Kopecky and Chanel Richardson both work for 22 MGGG, but their work for you, in support of your 23 drafting this report, was done on nights and 24 weekends or not on MGGG time. Is that correct?	
25 A. That's right.	
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1 Q. Did they do it in the Barnum Hall MGGG 2 office?	1 because you're on leave?
3 A. Well, Chanel lives in North Carolina and 4 has rarely set foot in Barnum Hall.	2 A. To zero. That's right.
5 Q. Okay. So she didn't help out Liz?	3 Q. That would be a reduction, I would 4 think.
6 A. No. Liz sometimes comes into the office 7 but probably wouldn't have done this work in the 8 office. Maybe at home, but I'm speculating.	5 A. Yes.
9 Q. Okay. You really don't know where she 10 did it?	6 Q. Were you on leave in 2019?
11 A. I can't be sure.	7 A. I have been on leave for the whole 8 academic year, '19 to '20. Wait. Sorry. '19. No. 9 Sorry. I'm getting confused about dates. I have 10 been on leave for the current academic year, which 11 is '21, '22.
12 Q. Do you know who owned the computer that 13 she did the work on?	12 In 2019 I may have been on leave. I 13 have been on leave a lot in the last few years. I 14 was a Radcliffe fellow in 2018 to 2019, and so I was 15 likely on leave at that time.
14 A. I do not.	16 Q. Okay. But you have worked with MGGG and 17 Redistricting Lab, LLC during the time that you were 18 on leave. Correct?
15 Q. Okay. Is it possible, does she have a 16 computer that's owned by Tufts for her work with 17 MGGG?	19 A. Yes. So the LLC was probably created in 20 2020 or thereabouts.
18 A. That is likely.	21 Q. November of 2019 sound familiar?
19 Q. Okay. Is it also possible that she used 20 her MGGG computer to do work for you in support of 21 this report?	22 A. That could be right, yeah. And the -- 23 let's see. The lab at Tufts, I ran summer programs 24 under the name of MGGG in summer of 2018 and '19. I 25 can't remember when we shifted the name to include

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<p style="text-align: right;">Page 242</p> <p>1 the word "Lab," but it might have been in 2019. 2 That sounds possible. 3 Q. Okay. So on your conflict of interest 4 form you disclosed to the University the existence 5 of Redistricting Lab, LLC, and you either disclosed 6 or assumed that Tufts knows about MGGG and your 7 association with it? 8 A. No, the lab -- definitely, the lab is 9 part of my annual faculty information form. 10 Q. Do you describe in any way the overlap 11 between the work of Redistricting Lab, LLC and the 12 lab? 13 A. Well, when I set up the LLC I had 14 several meetings with University counsel to be sure 15 that I was setting everything up in accordance with 16 University policy. So I have met with -- I have met 17 with general counsel for the University to be sure 18 that I'm doing everything on the up and up. 19 Q. Okay. Did you disclose to general 20 counsel, either at that meeting or through your 21 conflict of interest forms, that the work with 22 Redistricting Lab, LLC for which you're being 23 compensated would rely on work that was paid for by 24 the federal government in the convergence 25 accelerator grant?</p>	<p style="text-align: right;">Page 244</p> <p>1 because of the research they have done, but you 2 don't think it's significant that the research was 3 explicitly paid for by the federal government and 4 then you're using it to make money is something that 5 needs to be disclosed to the University? 6 A. That's 100 percent standard. That's 7 how -- that's how scholarship works. That's why -- 8 in my understanding, that's how the standards for 9 experts work, is that the entire design of the 10 system is that your scholarly expertise which, in 11 the best case, would be funded by the federal 12 government, would then be brought to bear in matters 13 of interest to courts. I think that's how the 14 system works. 15 Q. Okay. But did you disclose those 16 specific facts to Tufts? 17 A. I think those are well understood by all 18 parties, and so I very much doubt that anything was 19 said explicitly. I take that to be common 20 understanding of how the system works. 21 Q. So you made a decision on your own that 22 that was not a conflict of interest and chose not to 23 disclose it to Tufts. Is that correct? 24 MS. ADEN: Objection. 25 THE WITNESS: I think I have answered</p>
<p style="text-align: right;">Page 243</p> <p>1 A. It's an absolutely well-understood 2 principle of faculty activities that your research 3 is not neatly separable between roles. And so I 4 should mention that in addition to talking to Tufts 5 University counsel, I also talked to numerous 6 experienced expert witnesses from other universities 7 to be sure that I was setting things up in 8 accordance with best practices. And I assure you 9 that everything has been done quite scrupulously. I 10 feel very confident about that.</p> <p>11 Q. Sure. This is a simple yes or no 12 question. Did you tell any of those folks that you 13 asked for advice that an article that was produced, 14 as a result of this grant to Tufts, was going to 15 support or form the basis of your report for which 16 you would be paid?</p> <p>17 A. I don't need to mention that because 18 that's -- I think that is the reason that people who 19 do scholarship are asked to be experts, so that they 20 can reference their scholarship. I don't think 21 there is any disclosure there. That would be taken 22 for granted by anyone who has experience with 23 faculty working as expert witnesses.</p> <p>24 Q. I don't doubt that, in part, the reason 25 that academics are asked to be expert witnesses is</p>	<p style="text-align: right;">Page 245</p> <p>1 fully. I don't think that's -- I think the 2 relationship of my scholarship to my consulting is 3 not only completely standard but is the design of 4 the system of expert witnesses, as I understand it 5 as I read the Daubert standard and so on.</p> <p>6 BY MR. MATHIAS:</p> <p>7 Q. But this is a simple question. You can 8 answer yes or no and then explain. Isn't it true 9 that you made the decision that this NSF grant 10 resulting in this article, that is used in your 11 report, was not a conflict of interest on your own 12 and that is why you did not disclose it to the 13 University?</p> <p>14 MS. ADEN: Objection.</p> <p>15 BY MR. MATHIAS:</p> <p>16 Q. Yes or no and then explain.</p> <p>17 A. I would answer yes or no if I could. 18 But the truth is that I don't know if that was 19 brought up. And the reason I don't know if that was 20 brought up is that I wouldn't have perceived a need. 21 But this is a conversation from years ago, so I'm 22 doing my best to represent it fully and honestly.</p> <p>23 BY MR. MATHIAS:</p> <p>24 Q. Okay. But there is no doubt you didn't 25 specifically tell the University that one of the</p>

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<p>1 articles that was produced by this grant is being 2 used by you in a manner that is to your personal 3 financial benefit. Correct?</p> <p>4 A. I can't be sure if a sentence to that 5 effect was uttered. But I can tell you, with 6 certainty, that sitting here today I don't perceive 7 that it would be necessary to spell that out.</p> <p>8 Q. And that's based upon your own judgment. 9 Correct?</p> <p>10 A. Yes. And my understanding of the 11 system.</p> <p>12 Q. Okay. Did you tell the University that 13 it's a possibility that some of the individuals that 14 were helping you with this report were using 15 computers owned by Tufts?</p> <p>16 A. Did I say that that was possible? No. 17 However, I am aware that Tufts' computers should not 18 be used for that purpose. And so I'm aware that the 19 policy is that that shouldn't happen. But since I 20 am not Liz and I am not Chanel, I cannot testify 21 under oath that they followed the policy. But they 22 are aware that the policy is not to use University 23 resources for litigation purposes.</p> <p>24 Q. And you didn't do anything to ensure 25 that they followed that policy in working for the</p>	<p>1 or six years. Is that correct? Do I have that 2 right?</p> <p>3 A. You do. Yes.</p> <p>4 Q. Do you happen to know the funding source 5 for that renovation?</p> <p>6 A. I really don't. I do know the funding 7 source for the new math department building, if 8 you're curious.</p> <p>9 Q. I'm not. If I told you that the funding 10 source was a Massachusetts State organization 11 intended to issue bonds to support economic 12 development, would you have any reason to disagree 13 with me?</p> <p>14 A. No. I have no opinions on the matter.</p> <p>15 Q. Are you aware of the fact that Tufts 16 could have some significant tax issues if it is a 17 conflict of interest for you to be making money 18 through Research Lab, LLC by using either the 19 academic outputs of the MGGG as funded by the NSF or 20 Tufts' computers?</p> <p>21 MS. ADEN: Objection.</p> <p>22 BY MR. MATHIAS:</p> <p>23 Q. Do you have any reason to believe that 24 there could be tax consequences for Tufts because -- 25 well, there could be tax consequences for Tufts if</p>
<p style="text-align: right; padding-right: 10px;">Page 247</p> <p>1 Redistricting Lab, LLC. Correct?</p> <p>2 A. Well, since I supervise them it is my 3 job to make them aware of the policy, and it's my 4 job to talk through, periodically, with everyone who 5 works for the lab and everyone who works for the 6 LLC, the lines that we draw in order to be sure that 7 we are conducting ourselves with best practices. So 8 we have had that conversation, as a lab, as recently 9 as this summer. That's a conversation I have 10 regularly. But I do not monitor them, if that's 11 what you're asking. I make sure they are aware of 12 the rules and the expectations.</p> <p>13 Q. Do you happen to know whether or not 14 Tufts is a tax-exempt organization?</p> <p>15 A. I should maybe know the answer to that, 16 but I don't.</p> <p>17 Q. Okay. If I represented to you that 18 Tufts is a tax-exempt 501c3 organization, would you 19 have any reason to disagree with me?</p> <p>20 A. No. I would certainly believe you.</p> <p>21 Q. Okay. You said you're sitting in Barnum 22 Hall?</p> <p>23 A. That's right.</p> <p>24 Q. I assume you're aware that Barnum Hall 25 was renovated extensively within the last maybe five</p>	<p style="text-align: right; padding-right: 10px;">Page 249</p> <p>1 the arrangements we have been discussing, vis-à-vis 2 the grants and Research Lab, LLC are deemed to be a 3 conflict of interest?</p> <p>4 MS. ADEN: Objection.</p> <p>5 THE WITNESS: I think you're asking if 6 there could be tax consequences for breaking the 7 conflict of interest policy, and I believe that that 8 would be possible.</p> <p>9 BY MR. GORE:</p> <p>10 Q. Okay. And tax consequences both because 11 Tufts is a 501c3 and because the building in which 12 MGGG is located was financed with state bonds?</p> <p>13 A. This is really beyond -- far, far beyond 14 my expertise. I just simply don't know how the 15 funding of the building has anything to do with -- I 16 just don't know how these -- but I would be happy to 17 find out.</p> <p>18 Q. Do you think that NSF or Tufts should 19 have been given all of the facts in order to 20 determine if a conflict of interest exists, as 21 opposed to you making a determination that they 22 didn't need to know certain facts?</p> <p>23 MS. ADEN: Objection.</p> <p>24 THE WITNESS: I find the question a bit 25 mystifying, but I will attempt to answer it as well</p>

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<p style="text-align: right;">Page 250</p> <p>1 as I can. I think it is my responsibility to learn 2 about the conflict of interest policy and to follow 3 it to the very best of my ability. Now, that will 4 certainly involve some judgment calls. I don't deny 5 that. That's the nature of conflict of interest. 6 But I have been quite scrupulous about following the 7 rules to the best of my ability.</p> <p>8 BY MR. MATHIAS:</p> <p>9 Q. Assuming that it is a conflict of 10 interest that you have engaged in, do you believe 11 that Tufts should have been given the opportunity to 12 make a determination if it was a conflict of 13 interest by being given all the facts?</p> <p>14 MS. ADEN: Objection.</p> <p>15 THE WITNESS: I don't think that 16 question makes sense. Can you rephrase it?</p> <p>17 BY MR. MATHIAS:</p> <p>18 Q. Sure. Did you intentionally withhold 19 relevant facts from Tufts in order to prevent them 20 from making a determination as to whether or not 21 you're engaged in a conflict of interest?</p> <p>22 MS. ADEN: Objection.</p> <p>23 THE WITNESS: Thank you for rephrasing. 24 That's much clearer. I certainly did not. I 25 disclosed all facts I thought to be relevant and</p>	<p style="text-align: right;">Page 252</p> <p>1 just -- 2 A. No. We are talking about hours overall. 3 I bill a small fraction of those because I only bill 4 the hours that are directly related to the contracts 5 that I have signed. 6 Q. I understand that concept, for sure. 7 You mentioned that your interests in the 8 mathematical side of politics, if that's the 9 appropriate characterization, began in 2016. Is 10 that correct? 11 A. Yeah. I would say my research program 12 in data and democracy began in 2016. That's right. 13 Q. Do you know about when? 14 A. Sure. I was teaching a course called 15 Mathematics of Social Choice. I guess I don't quite 16 remember, I could look it up, whether it was in the 17 fall or the spring. But one of those semesters I 18 was teaching a Voting Theory course, and that was 19 the genesis of the research interest. 20 Q. And not the MGGG Redistricting Lab but 21 the collective called the Metric Geometry and 22 Gerrymandering Group, when did that start, the more 23 informal group? 24 A. That's when that started. So I took an 25 interest while I was teaching this course. I had a</p>
<p style="text-align: right;">Page 251</p> <p>1 then some.</p> <p>2 BY MR. MATHIAS:</p> <p>3 Q. What is the Redistricting Lab, LLC's 4 monthly revenue, on average?</p> <p>5 A. I have no idea. I really don't know.</p> <p>6 Q. How many clients --</p> <p>7 A. That I can answer. The disclosed 8 relationships with civil rights litigation firms and 9 with other law firms are -- I have worked with LDF, 10 as you heard. I have worked with the Lawyers 11 Committee for Civil Rights under law. I have worked 12 with Jenner & Block, which is another law firm. And 13 I believe those are the only -- I believe, yeah, 14 those are -- as I sit here today and with a full 15 attempt to be forthcoming, I think those are the 16 only clients.</p> <p>17 Q. And you're on leave from Tufts now. 18 Approximately how many hours a week do you work for 19 Redistricting Lab?</p> <p>20 A. I work too much. I think I recently 21 reduced my hourly work from about seventy hours a 22 week, which was my average from last summer through 23 earlier this year, down to a more manageable, I 24 would estimate, fifty hours a week at this point.</p> <p>25 Q. And are we talking billable hours or</p>	<p style="text-align: right;">Page 253</p> <p>1 few friends who you can find biographies of on our 2 website, namely Ari and Mira originally. And the 3 three of us kind of came up with the name and the 4 concept of MGGG as an informal collective. 5 Justin Solomon, my earlier-mentioned 6 collaborator from MIT, joined as a kind of force 7 member after a few months, and so we were the 8 original four friends thinking about these issues. 9 That's what evolved over the span of the next few 10 years into the lab that I now direct. 11 Q. And when did it become the lab that was, 12 I guess, formal or official enough to apply for 13 grants and things like that? 14 A. Well, again, when I apply for grants I 15 do so as an individual. But I often talk about the 16 work of the lab as part of it. So you should think 17 of the grantee as me in support of the lab. 18 Okay. Our first grants to support MGGG 19 activities would have been in 2017 when we launched 20 a workshop cycle. We had -- I think it was five 21 workshops in 2017 and '18 in Boston, Madison, 22 Durham, North Carolina, Austin, Texas and San 23 Francisco, and some of those were funded by various 24 foundations such as the Sloan Foundation. 25 Q. Okay. And then the grant that you have</p>

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<p style="text-align: right;">Page 254</p> <p>1 said was the biggest MGGG -- or you had received 2 from MGGG work was in September 2019. When did you 3 begin leave -- or let me rephrase that. How much 4 and when have you been on leave since the end of 5 2019?</p> <p>6 A. Okay. Let's see. I can try to 7 reconstruct it. So the 2018 to '19 year -- yeah, 8 2018 to '19 year is the year I spent at Radcliffe. 9 So I was on leave, supported by Radcliffe and 10 Guggenheim for projects related to redistricting.</p> <p>11 After the '19, '20 year I think I was 12 back at Tufts. And yes, I was definitely teaching 13 when the shutdown happened in March of 2020. I was 14 teaching again the following semester. I'm not sure 15 about the spring. I mean, I can look this up if you 16 like.</p> <p>17 And as I said, I have been on leave all 18 of this academic year. And I'm on leave again the 19 next academic year. So it would be fair to say that 20 I have been on leave as much as I have not over the 21 last few years.</p> <p>22 Q. Okay. And so you received this grant in 23 September 2019. And you would not have any reason 24 to disagree with me that Redistricting Lab, LLC was 25 formed less than sixty days later. Does that sound</p>	<p style="text-align: right;">Page 256</p> <p>1 purposes I am -- I am the LLC. It's what is meant 2 by doing business as, in my understanding. 3 Q. Okay. If you will bear with me one 4 minute, I have five minutes or less, I just need to 5 pull something up. And I can flip through these. 6 Who is Ben Fifield?</p> <p>7 A. Okay. Ben is a PhD graduate. 8 MS. ADEN: I'm going to object. I don't 9 think these are the nature of any questions by 10 Mr. Gore. So this is not redirect -- or not 11 redirect. This is not appropriate -- 12 MR. MATHIAS: This is my own -- 13 (cross-talking). 14 MS. ADEN: -- examination of the 15 testimony of Dr. Duchin from direct. 16 MR. MATHIAS: This is my own direct 17 examination of her. That has nothing to do with 18 what I can ask her. 19 BY MR. MATHIAS: 20 Q. Who is Ben Fifield? 21 A. Right. So I believe Ben is a recent 22 PhD. At least he was a PhD student. And I think he 23 received his PhD from Princeton University in 24 Political Science within the last few years. He now 25 works, as I understand it, at ACLU.</p>
<p style="text-align: right;">Page 255</p> <p>1 about right? 2 A. I believe you. 3 Q. And then you have been on leave doing 4 seventy or fewer hours a week working for 5 Redistricting Lab, LLC for a large majority of the 6 time since then? 7 A. Just to clarify, for your records, the 8 LLC is what's called -- I don't know if this 9 national or more of a Massachusetts thing, it's 10 called a d/b/a, doing business as. And so the LLC, 11 sort of, is me. There is not a very sharp legal 12 distinction between me, as an individual, and the 13 LLC. So when you say doing work for the LLC, that 14 just means doing work. 15 Q. But you are the sole member of the LLC 16 in Massachusetts called Redistricting Lab, LLC? 17 A. I'm the director. There is also -- at 18 the moment there is another full-time employee and 19 several part-time people who do various hourly work. 20 Q. But all of its income -- all of its 21 profits are attributable to you for tax purposes. 22 Is that correct? 23 A. That's right. That's my understanding. 24 And again, just as I'm not a lawyer, I'm also not an 25 accountant. But my understanding is that for tax</p>	<p style="text-align: right;">Page 257</p> <p>1 Q. Okay. And do you have an LDF email 2 address? 3 A. Do I have an LDF email address? 4 Q. Yes. 5 A. No, I do not, not to my knowledge. 6 MR. MATHIAS: Okay. That's all I have 7 got. 8 MS. ADEN: I have very few because of in 9 the interest of time. I can go directly into it, 10 but Dr. Duchin, if you need a minute I can also give 11 that to you. 12 THE WITNESS: No. Let's roll through. 13 CROSS-EXAMINATION 14 BY MS. ADEN: 15 Q. Okay. Dr. Duchin, do you recall 16 Mr. Gore asking if you have been retained by the 17 ACLU in this congressional phase of the case? 18 A. I don't remember the phrasing, but I 19 remember responding. But I have not been retained 20 through the ACLU. 21 Q. For this case do you understand that 22 ACLU is co-counsel with LDF in the congressional 23 phase of the case? 24 A. Yes, that's my understanding. 25 Q. And you have also worked with ACLU</p>

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<p>1 attorneys in preparing your reports, including for 2 this congressional phase of this case?</p> <p>3 A. I'm not sure what "worked with" means.</p> <p>4 I think that -- I think that all the feedback that I 5 have received has come from you, but it may well 6 have incorporated comments from ACLU attorneys that 7 would not have raised my eyebrows.</p> <p>8 Q. Even though you work with some LDF 9 attorneys more directly, is it possible your 10 retainer agreement is jointly with ACLU, as well as 11 LDF as co-counsel?</p> <p>12 A. I see. I apologize if I am not getting 13 all the details perfectly. I had the impression 14 that it was with LDF, but I agree that it's possible 15 that the retainer agreement mentions ACLU. I'm not 16 sure about that.</p> <p>17 Q. Dr. Duchin, do you recall Mr. Gore 18 asking you questions about the House and Senate's 19 separate redistricting criteria?</p> <p>20 A. Yes. In particular, the Guidelines 21 documents were discussed extensively -- quite 22 extensively.</p> <p>23 Q. And do you first recall Mr. Gore asking 24 you questions about your description of first- and 25 second-tier criteria in both documents?</p>	<p>1 A. I'm sorry. I must be getting tired.</p> <p>2 "Where practical and appropriate, in no particular 3 order of preference, are."</p> <p>4 Q. Based on what you just read, do you 5 understand these to be second-tier or somehow lower 6 in priority than the Roman numeral categories that 7 precede it?</p> <p>8 A. Yes, I think that's the clear 9 implication of the phrasing.</p> <p>10 Q. And if you look at the House Guidelines 11 which have been marked, I believe, as Defendant's 12 Exhibit 3 --</p> <p>13 A. Yes.</p> <p>14 Q. -- Roman numeral IX, there is a section 15 titled: "Priority of Criteria"?</p> <p>16 A. That's right.</p> <p>17 Q. Okay. And that is the bulk of the 18 criteria of the tiers that you were speaking about 19 earlier in the deposition?</p> <p>20 A. Yes. That makes, fairly explicit, which 21 are the prioritized and which are the less 22 prioritized of the criteria.</p> <p>23 Q. So is it fair to say that based upon 24 your review, both sets of Guidelines had tiers of 25 criteria that you were aware of as you prepared your</p>
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<p>1 A. We talked about the phrase "first and 2 second tier." I believe I explained my use of that 3 phrase with respect to one of the documents more 4 than the other. Generally, it was meant to -- I was 5 trying very earnestly, in my report, to summarize 6 both documents together because they agree in many 7 places, even though they differ in a few.</p> <p>8 Q. And if you could look at the Senate 9 Guidelines, which I believe have been marked as 10 Defendant's Exhibit 4, and turn to Roman numeral 11 III.</p> <p>12 A. Yes. I'm doing that now.</p> <p>13 Q. And if you look at Roman numeral III, 14 does it read: "ADDITIONAL CONSIDERATIONS"?</p> <p>15 A. That's right. The bold and capital text 16 of the heading is: "ADDITIONAL CONSIDERATIONS."</p> <p>17 Q. And do you mind reading the first 18 sentence -- or clause that follows?</p> <p>19 A. Sure. It says, quote: "Other criteria 20 that should be given consideration, where practical 21 and appropriate, in no political order of 22 preference, are," and then it continues with A 23 through F.</p> <p>24 Q. And I think you said "political." Did 25 you mean "particular order"?</p>	<p>1 reports?</p> <p>2 A. Yes, I think that is definitely fair to 3 say.</p> <p>4 Q. Okay. And do you recall Mr. Gore's 5 questions about the use of race in drawing maps?</p> <p>6 A. Broadly, yes.</p> <p>7 Q. And if you look at Roman numeral I B. in 8 the Senate Redistricting Guidelines which, again, 9 should be Defendant's Exhibit 4 --</p> <p>10 A. Yes.</p> <p>11 Q. -- do you see the first two lines that 12 read: "A redistricting plan for the General 13 Assembly or Congress must not have either the 14 purpose or the effect of diluting minority voting 15 strength and must otherwise comply with Section 2 of 16 the Voting Rights Act, as expressed through 17 Thornburg versus Gingles and its progeny, and the 18 Fourteenth and Fifteenth Amendments to the U.S. 19 Constitution"?</p> <p>20 A. I'm sorry. I have been catching up. 21 This is in the Senate Guidelines?</p> <p>22 Q. Yes, Roman numeral II B.</p> <p>23 A. I don't see a II B. in the Guidelines.</p> <p>24 Q. Under B., Voting rights.</p> <p>25 A. So that's I B. Yes, what you just said</p>

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<p style="text-align: right;">Page 262</p> <p>1 is exactly in there in I B. That's right.</p> <p>2 Q. Then I'm also going to have you look at</p> <p>3 the House Guidelines, Roman numeral II.</p> <p>4 A. Yes.</p> <p>5 Q. And can you read the first sentence,</p> <p>6 please?</p> <p>7 A. Yes. It says, quote: "Redistricting</p> <p>8 plans shall also comply with federal law and the</p> <p>9 Voting Rights Act of 1965, as amended."</p> <p>10 Q. And can you read the second-to-last full</p> <p>11 sentence of that same paragraph?</p> <p>12 A. Yes, I can. It says: "The dilution of</p> <p>13 racial or ethnic minority voting strength is</p> <p>14 contrary to the laws of the United States and of the</p> <p>15 State of South Carolina, and also is against the</p> <p>16 public policy of this state."</p> <p>17 Q. Now, I'm not asking you for any legal</p> <p>18 determinations, but based upon your experiences and</p> <p>19 expertise and your testimony about having drawn maps</p> <p>20 on other occasions, is it common to look at the</p> <p>21 Black voting age population and other race-conscious</p> <p>22 considerations to develop maps under these</p> <p>23 criteria -- these types of criteria?</p> <p>24 A. In other words, if there is a principle</p> <p>25 against dilution, is it then common to use BVAP,</p>	<p style="text-align: right;">Page 264</p> <p>1 Women Voters proposed maps?</p> <p>2 A. Yes, I do remember that.</p> <p>3 Q. And looking at page 10, do you see there</p> <p>4 are deviations of one, two or even three people, as</p> <p>5 compared to the enacted map?</p> <p>6 A. That's right. The top-to-bottom</p> <p>7 deviation of the enacted map is one. And for the</p> <p>8 others -- for the NAACP maps 1 and 2, the</p> <p>9 top-to-bottom deviations are two and four,</p> <p>10 respectively. For Harpootlian and the League it's</p> <p>11 four and five, respectively.</p> <p>12 Q. Based upon your experience of map</p> <p>13 drawing, is it complicated to fix such minimal</p> <p>14 population deviations as those?</p> <p>15 A. I would call it absolutely</p> <p>16 uncomplicated. In fact, I would call it routine.</p> <p>17 And this was discussed earlier in the</p> <p>18 deposition when I mentioned verifying, by hand, that</p> <p>19 it's easy to tune a map with as much as 1 percent</p> <p>20 population deviation, which is much higher than</p> <p>21 this, can easily be tuned -- easily and quickly</p> <p>22 while maintaining its other important measurable</p> <p>23 properties.</p> <p>24 Q. Do you recall Mr. Gore's questions about</p> <p>25 statistical measures of compactness?</p>
<p style="text-align: right;">Page 263</p> <p>1 say, as part of map development? Is that the</p> <p>2 question?</p> <p>3 Q. Yes.</p> <p>4 A. Yes, I would say that being aware of</p> <p>5 BVAP is consistent with nondilution.</p> <p>6 Q. And beyond BVAP, you testified that</p> <p>7 there are other race-conscious considerations that a</p> <p>8 mapmaker might be aware of in trying to pay</p> <p>9 attention to nondilution of minority voting</p> <p>10 strength?</p> <p>11 A. Absolutely. I think it's legitimate to</p> <p>12 be aware of various kinds of racial -- race-related</p> <p>13 considerations while pursuing a policy of</p> <p>14 nondilution.</p> <p>15 Q. Dr. Duchin, do you recall Mr. Gore's</p> <p>16 questions about total population deviation with</p> <p>17 respect to a few congressional maps submitted by</p> <p>18 members of the public?</p> <p>19 A. I do. And I think we were talking about</p> <p>20 it as top-to-bottom deviation.</p> <p>21 Q. And if you could look at page 10 of your</p> <p>22 report, your first report.</p> <p>23 A. Yes. I'm doing that now.</p> <p>24 Q. I believe Mr. Gore asked you about the</p> <p>25 Harpootlian South Carolina NAACP2 and the League of</p>	<p style="text-align: right;">Page 265</p> <p>1 A. I do recall discussing those.</p> <p>2 Q. Are you familiar with the Maptitude</p> <p>3 software for redistricting?</p> <p>4 A. I am familiar with it. I have, I</p> <p>5 believe, attended one Maptitude training at a</p> <p>6 workshop that I host.</p> <p>7 Q. Are you aware of whether it can run</p> <p>8 programs like statistical measures of compactness?</p> <p>9 A. It certainly can. And I believe I</p> <p>10 recall that the cut-edges measure was added to the</p> <p>11 package in this redistricting cycle.</p> <p>12 Q. And do you have any sense of how long it</p> <p>13 might take to run one or more statistical measures</p> <p>14 of compactness using Maptitude?</p> <p>15 A. I think it's fair to call it</p> <p>16 instantaneous.</p> <p>17 Q. Do you recall Mr. Gore's questions about</p> <p>18 how you reviewed and incorporated public testimony</p> <p>19 collected by the South Carolina Legislature?</p> <p>20 A. I do recall that discussion.</p> <p>21 Q. Do you recall how many hearings you</p> <p>22 reviewed?</p> <p>23 A. I don't have the exact number, but I</p> <p>24 believe we agreed that it would total more than</p> <p>25 1,000 pages of testimony.</p>

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<p style="text-align: right;">Page 266</p> <p>1 Q. And, in fact, that was a low estimate of 2 the number of pages of testimony? 3 A. I believe that to be a conservative 4 estimate. That's right. 5 Q. And that was over many months of 6 testimony being collected from the public? 7 A. Yes. I described the collection dates 8 in my report. And I will just quickly try to find 9 that page. 10 (Pause In Proceedings) 11 WITNESS CONTINUES: 12 A. I remember your question. And the 13 answer is that the report indicates the meetings 14 took place from July through October, considering 15 both Senate and House hearings. 16 Q. And do you have any reason to know 17 whether this testimony is not representative of 18 South Carolina communities? 19 A. I can't say one way or the other, except 20 to repeat what I said before, that it's the best 21 data available. It's the best information 22 available. 23 Q. Do you recall Mr. Gore's questions about 24 private criteria being considered by legislators or 25 General Assembly that is not available to members of</p>	<p style="text-align: right;">Page 268</p> <p>1 Q. This is my last question: Dr. Duchin, 2 do you recall Mr. Gore asking you questions about 3 circumstances when Democrat -- voters, affiliated as 4 Democrats, lose in a Republican-leaning 5 congressional district, for example, under certain 6 conditions in Congressional District 1? 7 A. Yes, I remember discussing that. 8 Q. In your reports do you address any 9 strategies that may make that outcome likely? 10 A. Strategies on the part of the State? 11 Q. Yes. 12 A. Yes. I look at the effectiveness of the 13 plans for the Democratic interests, and I separate 14 out the more probative elections for Black voters. 15 Q. And did you discuss strategy of cracking 16 as one means of trying to effectuate that type of 17 outcome? 18 A. Absolutely. Cracking is a means of 19 diluting the vote and making it more likely that 20 certain kinds of voters will not see their wishes 21 result in representation. 22 MS. ADEN: That's all the questions I 23 have. 24 MR. GORE: I have one question on 25 redirect.</p>
<p style="text-align: right;">Page 267</p> <p>1 the public during the redistricting process? 2 A. Yes, I recall discussing that. 3 Q. Based on your work and exposure to 4 principles of good governance, what do you think 5 about private criteria being used in a statewide map 6 drawing process that is not available to the public? 7 A. I would be very surprised if anyone 8 described that as a good practice for redistricting. 9 Q. Do you have any views of how the public 10 would be able to submit maps that complied with 11 private criteria that has not been disclosed to 12 them? 13 A. Except through guesswork, I can't 14 imagine how to comply with private criteria. 15 Q. What about the same question concerning 16 legislators who drew maps but were unaware of 17 private criteria? 18 A. The answer would be the same, they 19 cannot comply with private criteria except through 20 guesswork. 21 Q. Would maps you drew as alternatives for 22 Congress also risk not meeting private criteria if 23 you were unaware of those criteria? 24 A. That's right. I can only take into 25 account the criteria that I am made aware of.</p>	<p style="text-align: right;">Page 269</p> <p>1 REDIRECT EXAMINATION 2 BY MR. GORE: 3 Q. Ms. Aden just asked you about the 4 Guidelines and the references, the reference to 5 dilution of minority vote strength. Do you recall 6 that? 7 A. Yes. 8 Q. And do you know what the Guidelines 9 definition or standard for dilution of minority 10 voting strength is? 11 A. It is my recollection that there is no 12 definition offered. But in the interest of time, I 13 will leave it at that. 14 Q. And have you discussed that definition 15 with the author of the Guidelines? 16 A. I am not aware of who authored the 17 Guidelines. 18 MR. GORE: Nothing further. 19 (The deposition was concluded at 5:50 p.m.) 20 (The deponent does not waive reading and signing of 21 this deposition) 22 23 24 25</p>

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<p style="text-align: right;">Page 270</p> <p>1 CERTIFICATE OF REPORTER 2 I, Elaine L. Grove-DeFreitas, Certified 3 Shorthand Reporter and Notary Public for the State of 4 South Carolina at large, do hereby certify that the 5 foregoing transcript is a true, accurate and complete 6 record.</p> <p>7 I further certify that I am neither 8 related to nor counsel for any party to the cause 9 pending or interested in the events thereof.</p> <p>10 WITNESS MY HAND, I have hereunto 11 affixed my official seal this 23rd day of July 2022 at 12 Greenville County, South Carolina.</p> <p>13  14 </p> <hr/> <p>16 ELAINE L. GROVE-DEFREITAS 17 Certified Shorthand Reporter 18 My Commission Expires 6/22/2030</p>	<p style="text-align: right;">Page 272</p> <p>1 1 South Carolina State Conference Of The NAACP And Scott, Taiwan v. 2 McMaster, Henry, Et Al.</p> <p>2 2 Moon Duchin , PhD (#5278941)</p> <p>3 3 E R R A T A S H E E T</p> <p>4 4 PAGE____ LINE____ CHANGE_____</p> <p>5 5 _____</p> <p>6 6 REASON_____</p> <p>7 7 PAGE____ LINE____ CHANGE_____</p> <p>8 8 _____</p> <p>9 9 REASON_____</p> <p>10 0 PAGE____ LINE____ CHANGE_____</p> <p>11 1 _____</p> <p>12 2 REASON_____</p> <p>13 3 PAGE____ LINE____ CHANGE_____</p> <p>14 4 _____</p> <p>15 5 REASON_____</p> <p>16 6 PAGE____ LINE____ CHANGE_____</p> <p>17 7 _____</p> <p>18 8 REASON_____</p> <p>19 9 PAGE____ LINE____ CHANGE_____</p> <p>20 0 _____</p> <p>21 1 REASON_____</p> <p>22 2 _____</p> <p>23 3 _____</p> <p>24 4 Moon Duchin , PhD Date</p> <p>25 5 _____</p>
<p style="text-align: right;">Page 271</p> <p>1 1 Leah C. Aden Esquire 2 2 laden@naacpldf.org 3 3 July 25, 2022</p> <p>4 4 RE: South Carolina State Conference Of The NAACP And Scott, 5 Taiwan v. McMaster, Henry, Et Al.</p> <p>5 5 7/14/2022, Moon Duchin , PhD (#5278941)</p> <p>6 6 The above-referenced transcript is available for 7 7 review.</p> <p>8 8 Within the applicable timeframe, the witness should 9 9 read the testimony to verify its accuracy. If there are 10 10 any changes, the witness should note those with the 11 11 reason, on the attached Errata Sheet.</p> <p>12 12 The witness should sign the Acknowledgment of 13 13 Deponent and Errata and return to the deposing attorney.</p> <p>14 14 Copies should be sent to all counsel, and to Veritext at 15 15 erratas-cs@veritext.com.</p> <p>16 16 _____</p> <p>17 17 Return completed errata within 30 days from 18 18 receipt of testimony.</p> <p>19 19 If the witness fails to do so within the time 20 20 allotted, the transcript may be used as if signed.</p> <p>21 21 _____</p> <p>22 22 Yours,</p> <p>23 23 Veritext Legal Solutions</p> <p>24 24 _____</p> <p>25 25 _____</p>	<p style="text-align: right;">Page 273</p> <p>1 1 South Carolina State Conference Of The NAACP And Scott, Taiwan v. 2 McMaster, Henry, Et Al.</p> <p>2 2 Moon Duchin , PhD (#5278941)</p> <p>3 3 ACKNOWLEDGEMENT OF DEPONENT</p> <p>4 4 I, Moon Duchin , PhD, do hereby declare that I 5 5 have read the foregoing transcript, I have made any 6 6 corrections, additions, or changes I deemed necessary as 7 7 noted above to be appended hereto, and that the same is 8 8 a true, correct and complete transcript of the testimony 9 9 given by me.</p> <p>10 0 _____</p> <p>11 1 _____</p> <p>12 2 Moon Duchin , PhD Date</p> <p>13 3 *If notary is required</p> <p>14 4 SUBSCRIBED AND SWORN TO BEFORE ME THIS 15 5 ____ DAY OF _____, 20___. 16 6 _____</p> <p>17 7 _____</p> <p>18 8 _____</p> <p>19 9 NOTARY PUBLIC</p> <p>20 0 _____</p> <p>21 1 _____</p> <p>22 2 _____</p> <p>23 3 _____</p> <p>24 4 _____</p> <p>25 5 _____</p>

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Federal Rules of Civil Procedure

Rule 30

(e) Review By the Witness; Changes.

(1) Review; Statement of Changes. On request by the deponent or a party before the deposition is completed, the deponent must be allowed 30 days after being notified by the officer that the transcript or recording is available in which:

(A) to review the transcript or recording; and

(B) if there are changes in form or substance, to sign a statement listing the changes and the reasons for making them.

(2) Changes Indicated in the Officer's Certificate. The officer must note in the certificate prescribed by Rule 30(f)(1) whether a review was requested and, if so, must attach any changes the deponent makes during the 30-day period.

DISCLAIMER: THE FOREGOING FEDERAL PROCEDURE RULES ARE PROVIDED FOR INFORMATIONAL PURPOSES ONLY.

THE ABOVE RULES ARE CURRENT AS OF APRIL 1, 2019. PLEASE REFER TO THE APPLICABLE FEDERAL RULES OF CIVIL PROCEDURE FOR UP-TO-DATE INFORMATION.

VERITEXT LEGAL SOLUTIONS
COMPANY CERTIFICATE AND DISCLOSURE STATEMENT

Veritext Legal Solutions represents that the foregoing transcript is a true, correct and complete transcript of the colloquies, questions and answers as submitted by the court reporter. Veritext Legal Solutions further represents that the attached exhibits, if any, are true, correct and complete documents as submitted by the court reporter and/or attorneys in relation to this deposition and that the documents were processed in accordance with our litigation support and production standards.

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